ENVIRONMENTAL PROTECTION AGENCY

SMALL BUSINESS INNOVATION RESEARCH PHASE I

RFP# SOL-NC-11-00012

ISSUE DATE: March 15, 2011

CLOSING DATE: May 3, 2011

* **CAUTION** - See Section V., Paragraph J.9(c), Instructions to Offerors, Concerning Late Proposals and Modifications.

Your proposal with an **original and two (2) copies** (including all appendices) shall be received at one of the following addresses by **12:00 p.m. (Noon) local time on May 3, 2011.** Offerors are encouraged to also include one CD-ROM with a Portable Document Form (PDF) copy of your proposal.

U.S. POSTAL SERVICE MAIL ADDRESS:

NOTICE: This address should NOT be used for U.S. Postal Service Express Mail Signature Required Service.

U.S. Environmental Protection Agency
Solicitation Number SOL-NC-11-00012- SBIR Phase I
Attention: Judy Ancharski SBIR Phase I
RTP Procurement Operations Division (E105-02)
Research Triangle Park, NC 27711

Offerors are advised that use of U.S. Postal Service Mail may result in delays in receipt of the offer at the required location. Offerors are further advised that delivery to the U.S. Post Office in Research Triangle Park, NC and the Post Office Boxes within that facility does not constitute delivery to the Procurement Operations Division of U.S. EPA in Research Triangle Park, NC.

HAND CARRIED, COURIER DELIVER, AND U.S. POSTAL EXPRESS MAIL SIGNATURE REQUIRED DELIVERY:

Notice: This address should be used for commercial delivery, including Federal Express, United Parcel Service, DHL, and similar carriers. It also includes any hand carried offer from the offeror or its agents. This address must also be used for U.S. Postal Service Express Mail Signature Required.

U.S. Environmental Protection Agency
Solicitation Number: SOL-NC-11-00012 SBIR Phase I
Attention: Judy Ancharski SBIR Phase I
RTP Procurement Operations Division (E105-02)
4930 Old Page Road
Durham, NC 27703

IMPORTANT:

Offerors should note and consider Federal Acquisition Regulation Clause 52.215(c)(3), "Instructions to Offerors – Competitive Acquisitions" concerning Late Proposals, Modification of Proposals and Withdrawal of Proposals.

It is the responsibility of Offerors to send proposals with sufficient time to allow delivery to the Procurement Operations Division by the date and time specified.

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APPENDICES

SBIR PHASE I SOLICITATION

I. PROGRAM DESCRIPTION

A. The Environmental Protection Agency (EPA) invites small business firms to submit research proposals under this Small Business Innovation Research (SBIR) Solicitation. The SBIR program is a phased process across the Federal Government of soliciting proposals and awarding funding agreements for research (R) or research and development (R&D) to meet stated agency needs or missions.

EPA is interested in advanced technologies that address priority environmental issues. This year's solicitation has nine topics grouped into five general areas: Safe and Sustainable Water Resources (topics include A. Drinking Water and B. Wastewater , Stormwater & Water Reuse), Chemical Safety for Sustainability (topic is C. Innovation in Manufacturing), Sustainable and Healthy Communities (topics include D. Green Building and E. Waste Monitoring), Air/Climate/Energy (topics include F. Greenhouse Gases and Other Climate Change Forcers, G. Air Pollution Monitoring and Control, and H. Sustainable Utilization of Biomass), and I. Homeland Security. This year's solicitation has a special focus on drinking water treatment technologies. The proposed research must directly pertain to EPA's environmental mission and must be responsive to EPA program interests included in the topic descriptions in this solicitation. (See next page for a listing of all research topics included in this solicitation.)

In order to facilitate proposal reviews by external peer reviewers with specialized expertise and by EPA technical personnel with focused program needs and priorities, offerors must designate a research topic for their proposal. The same proposal may not be submitted under more than one topic. An organization may, however, submit separate proposals on different topics, or different proposals on the same topic, as long as the proposals are not duplicates of the same research principle modified to fit the topic. If such duplicates are submitted, only one will be reviewed. Refer to Sections IV, V, and VI for additional requirements. Where similar research is discussed under more than one topic, the offeror shall choose the topic most relevant to the proposed research. It is the complete responsibility of offerors to select and identify the best topic for their proposals.

SBIR PHASE I RESEARCH TOPICS

SAFE AND SUSTAINABLE WATER RESOURCES

A. DRINKING WATER
    a. Drinking Water Treatment
    b. Drinking Water Monitoring and Infrastructure
B. WASTEWATER, STORMWATER, AND WATER REUSE

CHEMICAL SAFETY FOR SUSTAINABILITY

C. INNOVATION IN MANUFACTURING
    - Green Manufacturing
    - Pollution Prevention and Green Chemistry
    - Rare Earth Elements

SUSTAINABLE AND HEALTHY COMMUNITIES

D. GREEN BUILDING
    - Building Materials
    - Energy
    - Indoor Environmental Quality
    - Water Use and Management
E. WASTE MONITORING

AIR/CLIMATE/ENERGY

F. GREENHOUSE GASES AND OTHER CLIMATE CHANGE FORCERS
G. AIR POLLUTION MONITORING AND CONTROL
H. SUSTAINABLE UTILIZATION OF BIOMASS
    - Biofuels
    - Waste-to-Energy Systems

I. **HOMELAND SECURITY**
    - Decontamination and Waste Treatment/Disposal
    - Detection
    - Drinking Water and Wastewater Systems Security

B. Offerors are responsible for submitting proposals, and any modifications or revisions, so as to reach the Government office designated in this solicitation by the time specified in this solicitation. See Section V, Paragraph J.9(c), Instructions to Offerors, concerning Late Proposals and Modifications.

THIS SOLICITATION IS FOR PHASE I PROPOSALS ONLY.

To stimulate and foster technological innovation, including increasing private sector applications of Federal research or R&D, EPA's program follows the SBIR program's uniform process:

(1) **PHASE I**. Phase I involves a solicitation of proposals to conduct feasibility related experimental research or R&D related to described agency requirements. The objective of this phase is to determine the technical feasibility and preliminary commercialization potential of the proposed effort and the quality of performance of the small concern with a relatively small agency investment before consideration of further Federal support in Phase II. The Government is not obligated to fund any specific Phase I proposal. The maximum dollar amount of awards under this Phase I solicitation is $80,000 and the term of performance should not exceed six months.

(2) **PHASE II**. Phase II proposals may only be submitted by Phase I awardees invited to submit proposals. Phase II is the principal research or R&D effort and Phase II projects should normally be completed in 24 months. The objective is to continue the research or R&D initiated under Phase I and work toward commercialization of the technology. Phase II awards are expected to include full scale testing of the technology, but may not necessarily complete the total research and development that may be required to satisfy commercial or federal needs beyond the SBIR program. Completion of the research and development may be through Phase III.

It is anticipated that approximately 10 Phase II awards will be made, each with a dollar amount of $300,000 and a 24 - month term of performance. For Phase II, the Agency is planning to require a Phase II Commercialization Option under which Phase II offerors shall submit a proposal for $70,000 additional funding to expand R&D efforts to accelerate commercialization. EPA federal funds must be designated strictly for advancing the research related elements of the project. The entire Phase II proposal including the option will be evaluated together. The Agency would have a unilateral right to exercise the option after EPA's acceptance of the company's option documentation. Documentation for the Phase II Commercialization Option are receipts showing that at least $100,000 was transferred to the contractor from one or more third party investors, such as a venture capital firm, an individual "angel" investor, state or local funding source, or another company under a partnership, licensing or joint venture arrangement, or any combination of third parties.

or technologies awarded Phase I contracts under this solicitation and invited to submit a follow-on EPA Phase II Proposal, the follow-on Phase II Solicitation will be issued on/about July 15, ~~2011~~ 2012, and proposals will be due on/about September 15, ~~2011~~ 2012. The EPA Phase II evaluation criteria will be as follows:

PHASE II CRITERIA

1. Results of Phase I and degree to which research objectives and identified customer needs were met. Demonstration of performance/cost effectiveness and environmental benefits associated with the proposed research, including risk reduction potential.

2. Quality and soundness of the Phase II research plan to establish the technical and commercial viability of the proposed concept as evidenced through technology prototypes or initial commercial demonstrations.

3. Qualifications of the principal investigator, supporting staff and consultants. Time commitment of principal investigator and project team, adequacy of equipment and facilities and proposed budget to accomplish the proposed research. Adequacy of Phase II Quality Assurance Summary.

4. Potential of the proposed concept for significant commercialization applications. The quality and adequacy of the commercialization plan to produce an innovative product, process or device and getting technology prototypes or initial Phase II applications into commercial production and sales.

5. The offeror's SBIR or other research commercialization record. Existence of second phase funding commitments from private sector or non-SBIR funding sources. Existence of third phase follow-on commitments and presence of

other indicators of commercial potential of the idea.

(3) **PHASE III**. Where appropriate and needed in order to complete the research and development, there may be a third phase which is funded by:

1. Non-federal sources of capital for commercial applications of SBIR funded research or research and development.

2. Federal government with non-SBIR federal funds for SBIR derived products and processes that will be used by the federal government.

3. Non-SBIR federal funds for the continuation of research or research and development that has been competitively selected using peer review or scientific review criteria.

C. Each offeror submitting a proposal must qualify as a small business for research or R&D purposes at the time of award of Phase I and Phase II funding agreements. In addition, the primary employment of the principal investigator must be with the small business firm at the time of contract award and during the conduct of the proposed research. Principal investigators who appear to be employed by a university must submit a letter from the university stating that the principal investigator, if awarded a SBIR contract, will become a less-than-half-time employee of the university. Also, a principal investigator who appears to be a staff member of both the applicant and another employer must submit a letter from the second employer stating that, if awarded a SBIR contract, he/she will become a less than half-time employee of such organization. Letters demonstrating that these requirements have been fulfilled shall be submitted prior to contract award to the addressee stated in Section VI of this solicitation. Failure to do so may jeopardize award. Also, for both Phase I and Phase II, the research or R&D work must be performed in the United States. (For definition of the United States, see Section II. J.)

D. **For Phase I the Government anticipates the award of approximately $2.8M in firm fixed price contracts at approximately $80,000 each including profit,** but reserves the right to change either the number of awards or the amount of the individual awards depending on the outcome of the selection process. The contractor's period of performance is expected to be 6 months. Source selection will not be based on a comparison of cost or price. However, cost or price will be evaluated to determine whether the price, including any proposed profit, is fair and reasonable and whether the offeror understands the work and is capable of performing the contract.

E. Potential offerors are encouraged to communicate via E-mail. All inquiries concerning this solicitation shall be submitted to the following E-mail address:

Ancharski.judy@epa.gov

If E-mail is not available to you, written or telephone inquiries may be directed to:

U.S. Environmental Protection Agency
Attention: Judy Ancharski, SBIR Phase I
RTP Procurement Operations Division (E105-02)
Research Triangle Park, N.C. 27711
Telephone: (919) 541-5293 SBIR Hotline
Fax: (919) 541-4273

II. DEFINITIONS

For purposes of this solicitation, the following definitions apply:

A. Research or Research and Development (R/R&D): Any activity that is:

(1) A systematic, intensive study directed toward greater knowledge or understanding of the subject studied;

(2) A systematic study directed specifically toward applying new knowledge to meet a recognized need; or

(3) A systematic application of knowledge toward the production of useful materials, devices, and systems or methods, including design, development, and improvement of prototypes and new processes to meet specific requirements.

B. Funding Agreement: Any contract, grant, or cooperative agreement entered into between any Federal Agency and any small business concern for the performance of experimental, developmental, or research work, including products or services, funded in whole or in part by the Federal Government.

C. Subcontract: Any agreement, other than one involving an employer-employee relationship, entered into by an awardee of a funding agreement calling for supplies or services for the performance of the original funding agreement.

D. Small Business Concern: A small business concern is one that, at the time of award of Phase I and Phase II, meets all of the following criteria:

(1) Is organized for profit, with a place of business in the United States (US), which operates primarily within the US or which makes a significant contribution to the US economy through payment of taxes or use of American products, materials or labor;

(2) Is in the legal form of an individual proprietorship, partnership, limited liability company, corporation, joint venture, association, trust, or cooperative, except that where the form is a joint venture, there can be no more than 49 percent participation by business entities in the joint venture;

(3) Is at least 51% owned and controlled by one or more individuals who are citizens of, or permanent resident aliens in, the United States or it must be a for-profit business concern that is at least 51% owned and controlled by another for-profit business concern that is at least 51% owned and controlled by one or more individuals who are citizens of, or permanent resident aliens in, the US – (except in the case of a joint venture); and

(4) Has, including its affiliates, not more than 500 employees.

E. Socially and Economically Disadvantaged Small Business Concern: A socially and economically disadvantaged small business concern is one that is at least 51% owned and controlled by one or more socially and economically disadvantaged individuals, or an Indian tribe, including Alaska Native Corporations (ANCs), a Native Hawaiian Organization (NHO), or a Community Development Corporation (CDC). Control includes both the strategic planning (as that exercised by boards of directors) and the day-to-day management and administration of business operations. See 13 CFR 124.109, 124.110, and 124.111 for special rules pertaining to concerns owned by Indian tribes (including ANCs), NHOs or CDCs, respectively.

F. Socially and Economically Disadvantaged Individual: A member of any of the following groups:

(1) Black Americans;
(2) Hispanic Americans;
(3) Native Americans (American Indians, Eskimos, Aleuts, or Native Hawaiians);
(4) Asian-Pacific Americans (persons with origins from Burma, Thailand, Malaysia, Indonesia, Singapore, Brunei, Japan, China (including Hong Kong), Taiwan, Laos, Cambodia (Kampuchea), Vietnam, Korea, The Philippines, U.S. Trust Territory of the Pacific Islands (Republic of Palau), Republic of the Marshall Islands, Federated States of Micronesia, the Commonwealth of the Northern Mariana Islands, Guam, Samoa, Macao, Fiji, Tonga, Kiribati, Tuvalu, or Nauru);

(5) Subcontinent Asian Americans (persons with origins from India, Pakistan, Bangladesh, Sri Lanka, Bhutan, the Maldives Islands, or Nepal); and
(6) Other groups designated from time to time by SBA pursuant to Section 124.103 (d) of
1.13 CFR Ch.1(1-1-02 Edition).

G. Women-Owned Small Business Concern: A small business concern that is at least 51 % owned by and controlled by a woman or women. Control includes both the strategic planning (as that exercised by boards of directors) and the day-to-day management and administration of business operations.

H. Historically Underutilized Business Zone (HUBZone): A small business concern meeting the following requirements:

(1) Located in a HUBZone area located in one or more of the following:

a) A qualified census tract (as defined in Section 42(d)(5)(C)(i)(1) of the Internal Revenue Code of 1986;

b) A qualified "non-metropolitan county" (as defined in Section 143 (k)(2)(B) of the Internal Revenue Code of 1986) with a median household income of less than 80 percent of the State median household income or with an unemployment rate of not less than 140 percent of the Statewide average, based on US Department of Labor recent data; or,

c) Lands within the boundaries of federally recognized Indian reservations.

(2) Owned and controlled by one or more US Citizens; and,

(3) At least 35% of its employees must reside in a HUBZONE.

I. Primary Employment: More than one-half of the principal investigator's time is spent in the employ of the small business concern.

J. United States: The 50 States, the Territories and possessions of the Federal Government, the Commonwealth of Puerto Rico, the District of Columbia, the Republic of the Marshall Islands, the Federated States of Micronesia, and the Republic of Palau.

K. Commercialization: The process of developing marketable products or services and producing and delivering products or services for sale (whether by the originating party or by others) to Government or commercial markets.

L. SBIR Technical Data: All data generated during the performance of an SBIR award.

M. SBIR Technical Data Rights: The rights a small business concern obtains in data generated during the performance of any SBIR Phase I, Phase II, or Phase III award that an awardee delivers to the Government during or upon completion of a Federally-funded project, and to which the Government receives a license.

III. PROPOSAL PREPARATION INSTRUCTIONS AND REQUIREMENTS

A. PROPOSAL PAGE LIMIT

Proposals submitted in response to this Phase I of the SBIR program shall not exceed a total of **25 pages**, one side only. The only exception would be regarding the requirements set forth in Section III.D.12, "Prior SBIR Awards". The **25 pages** shall include the cover page, budget, and all enclosures or attachments. Pages (including enclosures or attachments such as letters of recommendation) should be of standard size (8 ½" x 11"; 21.6 cm x 27.9 cm) with 2.5 cm margins and type no smaller than 10 point font size. All pages shall be consecutively numbered. **Proposals in excess of the 25 page limitation shall not be considered for review or award.** Any additional attachments, appendices or references beyond the 25-page limitation shall result in the proposal not being considered for review or award. A letter of transmittal is not necessary. If one is furnished, it shall not be attached to every copy of the proposal. If a letter of transmittal is attached to every copy of the proposal, it will be counted as page 1 of the proposal. No binders are necessary. If binders are provided, they will be counted as pages even if no printing or writing is thereon.

B. PROPOSAL COVER SHEET

The offeror shall photocopy (or download from the Internet) and complete Appendix A of this solicitation which has the relevant solicitation number as page 1 of each copy of each proposal. **No other cover shall be permitted**. When downloading the solicitation from the Internet, Appendix A may print on no more than two pages, but will only count as one page per Appendix. If Appendix A exceeds two pages, any additional pages will count toward the 25-page limitation. Offerors may reformat the forms to correct spacing and pagination errors, however, identical information shall be provided.

The original of the cover sheet shall contain the pen-and-ink signatures of the principal investigator and the corporate/business official authorized to sign the proposal.

C. PROJECT SUMMARY

The offeror shall complete Appendix B as page 2 of each proposal. Appendix B may be no more than two pages, but will only count as one page per Appendix. If Appendix B exceeds two pages, any additional pages will count toward the 25-page limitation. Offerors may reformat the forms to correct spacing and pagination errors, however, identical information shall be provided. The Project Summary shall include a technical abstract with a brief description of the problem or opportunity, the innovation, project objectives, and description of the effort. In summarizing anticipated results, the implications of the approach (for both Phases I and II) and the potential commercial applications of the research shall be stated. **THE ABSTRACT (APPENDIX B) IS USED EXTENSIVELY DURING THE EXTERNAL PEER REVIEW AND EPA INTERNAL PROGRAMMATIC REVIEW.** The project summary and proposal title (Appendix B) of successful proposals will be published by EPA and, therefore, must not contain proprietary information. No changes shall be allowed.

D. TECHNICAL CONTENT

Begin the main body of the proposal on page 3. As a minimum, the following shall be included:

1. IDENTIFICATION AND SIGNIFICANCE OF THE PROBLEM OR OPPORTUNITY. A clear statement of the specific technical problem or opportunity addressed and the environmental benefits. **INFORMATION ON THE ENVIRONMENTAL BENEFITS ASSOCIATED WITH THE TECHNOLOGY IS A VERY IMPORTANT PART OF THE EXTERNAL PEER REVIEW AND EPA INTERNAL PROGRAMMATIC REVIEW.** Where appropriate, proposals should describe the positive and negative environmental impacts based on an assessment of the full life cycle of the new product or technology. Life Cycle Assessment (LCA) refers to the analysis of impacts throughout all stages of a product or process from production to use to disposal. Integration of a live cycle perspective into the environmental analysis typically considers impacts from raw materials extraction, manufacture, packaging, distribution and disposal.

2. PHASE I OBJECTIVES. State the specific objectives of Phase I research and development effort, including the technical questions it will try to answer to determine the feasibility of the proposed approach.

3. PHASE I WORK PLAN. This section provides a detailed description of the work plan. The work plan should describe what will be done, where it will be done and how the R/R&D will be carried out. The work planned to achieve each task should be discussed in detail, to enable a complete scientific and technical evaluation of the work plan. A work schedule should also be provided.

4. RELATED RESEARCH OR R&D. Describe significant research or R&D that is directly related to the proposal including any conducted by the project manager/principal investigator or by the proposing firm. Describe how it relates to the proposed effort, and any planned coordination with outside sources. Offerors must demonstrate their awareness of key recent research or R&D conducted by others in the specific topic area by providing appropriate references from the literature and other published documents.

5. KEY PERSONNEL AND BIBLIOGRAPHY OF DIRECTLY RELATED WORK. Identify key personnel involved in Phase I including their directly related education, experience and bibliographic information. Where vitae are extensive, summaries that focus on the most relevant experience or publications are desired and may be necessary to meet proposal size limitations.

6. RELATIONSHIP WITH FUTURE RESEARCH OR RESEARCH AND DEVELOPMENT. State the anticipated results of the proposed approach if the project is successful (Phase I and II). A discussion of cost-effectiveness is paramount, especially comparing the state-of-the-art approaches with the proposed approach. Discuss the significance of the Phase I effort in providing a foundation for Phase II R/R&D effort.

7. FACILITIES. A detailed description, availability and location of instrumentation and physical facilities proposed for Phase I shall be provided.

8. CONSULTANTS. Involvement of consultants in the planning and research stages of the project is permitted. If such involvement is intended, it should be described in detail and vitae should be provided.

9. COMMERCIALIZATION PLAN. Provide an abbreviated 2-3 page plan related directly to producing an innovative product, process or device and getting it into commercial production and sales. Comprehensive business plans (that are company rather than project oriented) are not desired. The Phase I plan is a roadmap toward producing a detailed Phase II Commercialization Plan which shall be required as part of the Phase II Application.

> NOTE: The Small Business Research and Development Enhancement Act of 1992 allows discretionary technical assistance to SBIR awardees. The Agency may provide up to $4,000 of SBIR funds for technical assistance per award. EPA intends to provide Phase I awardees with technical assistance through a separate EPA arrangement. For Phase I, this assistance will be in addition to the award amount. For Phase II, the law allows each awardee to expend up to $4,000 per year of the award amount for technical assistance services.

The Phase I plan shall provide limited information on the subjects described below. Explain what will be done during Phase I to decide on applications, markets, production and financing. The Commercialization Plan shall address:

a. SBIR Project: Brief description of the company, its principal field(s) of interest, size and current products and sales. A concise description of the SBIR project and its key technical objectives.

b. Commercial Applications: Potential commercial applications of the research results specifying customers and specific needs that will be satisfied. Have you or do you intend to file for one or more patents as a result of the SBIR project?

c. Competitive Advantages: What is particularly innovative about the anticipated technology or products? (Innovation may be expressed in terms of applications, performance, efficiencies or reduced cost. To determine if your innovation is likely to result in intellectual property that may be legally protected, it helps to conduct a patent search and look for related work being funded by EPA or another Federal agency. A fact sheet on how to search for patents and related federally-funded work is provided in Appendix D.) What significant advantages in application, performance, technique, efficiency, or costs, do you anticipate your new technology will have over existing technology? (In order to assess such advantages, it is useful to compare the anticipated performance of your technology against substitutable products currently being sold or emerging out of R&D. If regulations, industry standards or certifying requirements apply to your technology or product, these provide useful criteria for comparing your anticipated performance with potentially competing technology and products. However, other expressions of end-user needs may also contain important criteria).

d. Markets: What are the anticipated specific markets for the resulting technology, their estimated size, classes of customers, and your estimated market share 5 years after the project is completed and/or first sales? Who are the major competitors in the markets, present and/or anticipated?

e. Commercialization: Briefly describe how you plan to produce your product. Do you intend to manufacture it yourself, subcontract the manufacturing, enter into a joint venture or manufacturing agreement, license the product, etc.? Briefly describe the approach and steps you plan to take to commercialize the research results to significant sales. Do you plan to market the product yourself, through dealers, contract sales, marketing agreements, joint venture, sales representatives, foreign companies, etc.? How do you plan to raise money to support your commercialization plan?

10. SIMILAR OR CLOSELY RELATED SBIR AWARDS. If the small business concern has received ANY prior Phase I or Phase II award(s) from EPA or any Federal agency for similar or closely related research, submit name

of awarding agency, date of award, funding agreement number, amount and topic or subtopic title. **DESCRIBE THE TECHNICAL DIFFERENCES AND REASONS WHY THE PROPOSED NEW PHASE I RESEARCH IS DIFFERENT FROM RESEARCH CONDUCTED UNDER PRIOR SBIR AWARDS.** (This required proposal information **shall** be counted toward proposal pages count limitation.)

11. DUPLICATE OR EQUIVALENT SBIR PROPOSALS. A firm may elect to submit essentially equivalent work under other Federal Program Solicitations. In these cases, a statement shall be included in each such proposal indicating: the name and address of the agencies to which proposals were submitted or from which awards were received; date of proposal submission or date of award; title, number, and date of solicitations under which proposals were submitted or awards received; specific applicable research topics for each proposal submitted or award received; titles of research projects; name and title of project manager or principal investigator for each proposal submitted or award received. (This information **shall** count toward proposal pages count limitation.)

12. PRIOR SBIR AWARDS. If the small business concern has received ANY prior Phase II award from any Federal agency in the prior 5 fiscal years, submit name of awarding agency, date of award, funding agreement number, amount, topic or subtopic title, follow-on agreement amount, source and date of commitment and current commercialization status for each Phase II. (This required proposal information shall be included as an attachment to the proposals and **shall not** be counted toward proposal pages count limitation.) **Information provided shall be limited to what has been requested. Proposals that contain information in the attachment beyond what is requested shall count toward the 25 page limitation.**

E. COST BREAKDOWN/PROPOSED BUDGET

Complete the budget form in Appendix C and include the completed form immediately after proposal Section D.11. Photocopy the form for the required copies for submission. Incorporate the copy of the budget form bearing the original signature into the copy of the proposal bearing the original signature on the cover page. The completed budget form will count as one page in the 25 page limit. If budget explanation pages are included, they will count toward the 25 page limit. Offerors are encouraged to include the travel expenses on the budget form to attend a one-day SBIR Phase I Kick-Off Meeting in Washington, DC soon after the Phase I awards are made.

F. PHASE I QUALITY ASSURANCE STATEMENT (QAS)

Offerors must state whether or not their proposal involves data collection or processing, environmental measurements, modeling, or the development of environmental technology (whether hardware-based or via new techniques). The QAS describes processes that will be used to assure that results of the research satisfy the intended project objectives. EPA is particularly interested in the quality controls for data generation and acquisition, and how data validation and usability will be verified. This QAS should not exceed one page and will be included in the 25 page limitation for the proposal. The QAS should briefly address each of the sections below. If a section does not apply, provide a brief justification of why.

(1) Identify the individual who will be responsible for the quality assurance (QA) and quality control (QC) aspects of the research along with a brief description of this person's functions, experience and authority within the firm. Describe the firm's general approach for conducting quality research. (QA is a system of management activities to ensure that a process or product is of the type and quality needed for the project. QC is a system of activities that measure the attributes and performance of a process or product against the standards defined in the project to verify that they will meet those stated requirements.)

(2) Discuss project objectives, including quality objectives, any hypotheses to be tested, and the quantitative and/or qualitative procedures that will be used to evaluate the success of the project. Include any plans for peer or other reviews of the study design or analytical methods.

(3) Address the collection of new primary data, if applicable: (Note: In this case the word "sample" is intended to mean any finite part of a statistical population whose properties are studied to gain information about the whole. If certain attributes listed below do not apply to the type of samples to be used in the research, simply explain why those attributes are not applicable.)

Discuss the plan for sample collection and analysis. As applicable, include sample type(s), frequency, locations, sample sizes, sampling procedures, and the criteria for determining acceptable data quality (e.g., precision, accuracy,

representativeness, completeness, comparability, or data quality objectives). Describe the procedures for the handling and custody of samples including sample collection, identification, preservation, transportation, storage and how the accuracy of test measurements will be verified. Describe or reference each analytical method to be used, any QA or QC checks or procedures with the associated acceptance criteria, and any procedure that will be used in the calibration and performance evaluation of the analytical instrumentation. Discuss the procedures for overall data reduction, analysis and reporting. Include a description of all statistical methods to make inferences and conclusions, acceptable error rates and any statistical software to be used.

(4) Address the use of existing/secondary data (i.e., data previously collected for other purposes or from other sources), if applicable: Describe or reference each analytical method to be used, any QA or QC checks or procedures with the associated acceptance criteria, and any procedures that will be used in the calibration and performance evaluation of the analytical instrumentation. Discuss the procedures for overall data reduction, analysis and reporting. Include a description of all statistical methods to make inferences and conclusions, acceptable error rates and any statistical software to be used.

(5) Address method development, if applicable: (Note: The data collected for use in method development or evaluation should be described in the QAS as per the guidance in sections 3 and/or 4 above.) Describe the scope and application of the method, any tests (and measurements) to be conducted to support the method development, the type of instrumentation that will be used and any required instrument conditions (e.g., calibration frequency), planned QC checks and associated criteria (e.g., spikes, replicates, blanks), and tests to verify the method's performance.

(6) Address development or refinement of models, if applicable: (Note: The data collected for use in the development or refinement of models should be described in the QAS as per the guidance in sections 3 and/or 4 above.)

Discuss the scope and purpose of the model, key assumptions to be made during development/refinement, requirements for code development and how the model will be documented. Discuss verification techniques to ensure the source code implements the model correctly. Discuss validation techniques to determine that the model (assumption and algorithms) captures the essential phenomena with adequate fidelity. Discuss plans for long-term maintenance of the model and associated data.

(7) Address development or operation of environmental technology, if applicable: (Note: The data collected for use in the development or evaluation of the technology should be described in the QAS as per the guidance in sections 3 and/or 4 above.)

Describe the overall purpose and anticipated impact of the technology. Describe the technical and quality specifications of each technology component or process that is to be designed, fabricated, constructed and/or operated. Discuss the procedure to be used for documenting and controlling design changes. Discuss the procedure to be used for documenting the acceptability of processes and components, and discuss how the technology will be benchmarked and its effectiveness determined. Discuss the documentation requirements for operating instructions/guides for maintenance and use of the system(s) and/or process(s).

(8) Discuss data management activities (e.g., record-keeping procedures, data-handling procedures, and the approach used for data storage and retrieval on electronic media). Include any required computer hardware and software and address any specific performance requirements for the hardware/software configuration used.

A more detailed Proposal Quality Assurance Plan will be required in Phase II. The plan will be required as part of the first monthly report under the Phase II contract.

IV. METHOD OF SELECTION AND EVALUATION CRITERIA

All Phase I proposals will be evaluated and judged on a competitive basis by peer reviewers from outside EPA. Proposals will be initially screened to determine responsiveness. As noted in Section III, proposals exceeding the 25-page limitation will not be considered for review or award. Also, as noted in Section I, any proposal addressing more than one research topic and failing to identify the research topic by letter symbol on the cover page will not be considered for review or award. Proposals passing this initial screening will be reviewed for technical merit by external peer review meetings with technical experts, using the technical evaluation criteria described in A.1 below. Each of the criteria are equal in value. Peer reviewers will assign each proposal an adjectival rating of "excellent", "very good", "good", "fair" or "poor", using the specified criteria. Proposals rated "good", "fair", or "poor" will not be considered

for award. The proposals assigned “excellent” and “very good” ratings, will then be subjected to the programmatic review within EPA, to further evaluate these applications in relation to program priorities and balance using the criteria specified in A.2 below. Each proposal will be judged on its own merit. The Agency is under no obligation to fund any proposal or any specific number of proposals in a given topic. It also may elect to fund several or none of the proposed approaches to the same topic or subtopic.

A. TECHNICAL EVALUATION CRITERIA

1. EXTERNAL PEER REVIEW. The external peer review meetings will utilize the following evaluation criteria to rate each proposal. The criteria are of equal importance.

CRITERIA

a. The scientific and technical significance of the proposed technology and its appropriateness to the research topic. Quality and soundness of the research plan to establish the technical and commercial feasibility of the concept.

b. The uniqueness/ingenuity of the proposed concept or application as technological innovation. Originality and innovativeness of the proposed research toward meeting customer needs and achieving commercialization of the technology.

c. Potential demonstration of performance/cost effectiveness and environmental benefits associated with the proposed research, including risk reduction potential.

d. Qualifications of the principal investigator, supporting staff and consultants. Time commitment of principal investigator and project team, adequacy of equipment and facilities and proposed budget to accomplish the proposed research. Adequacy and quality of the Quality Assurance Statement.

e. Potential of the proposed concept for significant commercial applications. Potential for the commercialization plan to produce an innovative product, process or device and to put it into commercial production and sales. Potential market and competition and other financial/business indicators of commercialization potential and the offeror's SBIR or other research commercialization record.

Peer Review Panels exclude personnel from current Phase I contractors, Phase I offerors, and Phase II offerors from the panel. All peer reviewers will be queried on their SBIR contracts or proposals and will be required to sign an agreement to protect the confidentiality of all proposal material and to certify that no conflict of interest exists between the reviewer and the offeror. A copy of both forms is available upon request; however, the identity of the reviewers will not be released.

2. EPA PROGRAMMATIC REVIEW. The proposals that received ratings of "excellent" or "very good" by the external peer reviewer panel will be subject to the programmatic review by EPA program managers using the criteria set forth below to select which of the “excellent” and “very good” proposals will be funded. Please note that not all of the proposals rated “Excellent” or “Very Good” will receive a contract award. Projects will not be funded where EPA determines the proposed research is already being supported by EPA or another known source. The evaluation criteria “a” through “c” are of equal value and will be used to evaluate the applications in relation to program priorities, balance and programmatic relevancy.

CRITERIA

a. The potential of the technology to meet Agency program priorities and to strengthen the overall balance of the SBIR program. How well the technology fits into EPA’s overall research strategy or program within the Phase I research topic.

b. The potential of the technology to advance the principles of sustainability including environmental, economic and societal benefits.

c. The potential of the technology to have broad application or to impact large segments of the population.

B. RELEASE OF PROPOSAL REVIEW INFORMATION. After final award decisions have been announced, the technical evaluations of the offeror's proposal will be provided to the offeror. The identity of the reviewers shall not be disclosed.

V. CONSIDERATIONS

A. AWARDS

The Government anticipates award of approximately 35 firm-fixed-price contracts of up to $80,000 each including profit. It is expected that these contracts will be awarded with a contract start date of March 1, 2012. The period of performance for the contracts should not exceed six (6) months. The primary consideration in selecting proposals for award will be the technical merit of the proposal. Proposals shall be evaluated in accordance with the Technical Evaluation Criteria stated in IV.A. above. Source selection will not be based on a comparison of cost or price. However, cost or price will be evaluated to determine whether the price, including any proposed profit, is fair and reasonable and whether the offeror understands the work and is capable of performing the contract.

This current solicitation is for Phase I only, and the Government is not obligated to fund any specific Phase I proposal.

Funds are not presently available for this contract. The Government's obligation under this contract is contingent upon the availability of appropriated funds from which payment for contract purposes can be made. No legal liability on the part of the Government for any payment may arise until funds are made available to the Contracting Officer for this contract and until the Contractor receives notice of such availability, to be confirmed in writing by the Contracting Officer.

B. REPORTS

1. All reports shall include the following information: EPA Contract Number; Company Name; Project Title; and Period covered by the report. Contractors are encouraged to submit reports via email (unless otherwise specified).

2. The Contractor shall furnish a Monthly Report stating progress made. One (1) copy of the report shall be submitted to the Contract-level Contracting Officer's Representative (COR) with one (1) paper copy to the Contract Specialist. The report shall be submitted within seven (7) calendar days after the end of the reporting period. Specific areas of interest shall include progress made and difficulties encountered during the reporting period, and a statement of activities anticipated during the subsequent reporting period. The report shall include any changes in personnel associated with the project. Also, the first month's report shall contain a summary and schedule of accomplishments for the subsequent months of the project. The Monthly Report shall include, as an attachment, a copy of the monthly voucher for the same period.

3. One (1) copy of a comprehensive Final Report on the Phase I project must be submitted to the Contract-level COR by the completion date of the contract. The Contract Specialist shall receive one paper copy. This Final Report shall include a single-page project summary as the first page, identifying the purpose of the research, a brief description of the research carried out, the research findings or results, and potential applications of the research in a final paragraph. The balance of the report should indicate in detail the research objectives, research work carried out, results obtained, and estimates of technical feasibility. The report should include a discussion of any commercialization activity carried out during Phase I as well as future commercialization plans.

4. One (1) copy of a publishable (cleared for the general public) 2-3 page Executive Summary of the Final Report for Phase I must be submitted to the Contract-level COR by the completion date of the contract. This special report should be a true summary of the report, including the purpose of the project, work carried out and results. The summary should stress innovativeness and potential commercialization. The Executive Summary will be placed on the EPA SBIR website, and therefore, it should include the specific results the company is willing to release to the public.

C. PAYMENT SCHEDULE - Phase I payments will be made as follows:

Eighteen percent (18%) of the total contract price upon receipt and acceptance of a proper invoice with each of the first five monthly reports. The remainder shall be paid upon receipt and acceptance of the final report. Pursuant to the provisions of FAR 52.232-25, "Prompt Payment", payment will be rendered within thirty (30) days after receipt of a proper invoice.

D. INNOVATIONS, INVENTIONS AND PATENTS

1. LIMITED RIGHTS INFORMATION AND DATA

a. Proprietary Information

Information contained in unsuccessful proposals will remain the property of the offeror. The Government may, however, retain copies of all proposals. Public release of information in any proposal submitted will be subject to existing statutory and regulatory requirements.

If proprietary information is provided by an offeror in a proposal, which constitutes a trade secret, proprietary commercial or financial information, confidential personal information or data affecting the national security, it will be treated in confidence, to the extent permitted by law. This information must be clearly marked by the offeror with the term “confidential proprietary information" and the following legend must appear on the cover page of the proposal:

> "These data shall not be not be disclosed outside the Government and shall not be duplicated, used, or disclosed in whole or in part for any other purpose other than evaluation of this proposal. If a funding agreement is awarded to this offeror as a result of or in connection with the submission of these data, the Government shall have the right to duplicate, use, or disclose the data to the extent provided in the funding agreement and pursuant to applicable law. This restriction does not limit the Government's right to use information contained in the data if it is obtained from another source without restriction. The data subject to this restriction are contained in pages _____ of this proposal."

Any other legend may be unacceptable to the Government and may constitute grounds for removing the proposal from further consideration, without assuming any liability for inadvertent disclosure. The Government will limit dissemination of such information to within official channels.

b. Alternative to Minimize Proprietary Information: Offerors shall limit proprietary information to only that absolutely essential to their proposal.

c. Rights in Data Developed Under SBIR Funding Agreements: The Contract will contain a data clause which will provide the following:

SBIR RIGHTS NOTICE (MAR 1994)

These SBIR data are furnished with SBIR rights under Contract No._____ (and subcontract _____ if appropriate). For a period of four (4) years after acceptance of all items to be delivered under this contract, the Government agrees to use these data for Government purposes only, and they shall not be disclosed outside the Government (including disclosure for procurement purposes) during such period without permission of the Contractor, except that, subject to the foregoing use and disclosure prohibitions, such data may be disclosed for use by support Contractors. After the aforesaid 4-year period the Government has a royalty-free license to use, and to authorize others to use on its behalf, these data for Government purposes, but is relieved of all disclosure prohibitions and assumes no liability for unauthorized use of these data by third parties. This Notice shall be affixed to any reproductions of these data, in whole or in part.

d. Copyrights

With prior written permission of the Contracting Officer, the Awardee normally may copyright and publish (consistent with appropriate national security considerations, if any) material developed with EPA support. EPA receives a royalty-free license for the Federal Government and requires that each publication contain an appropriate acknowledgment and disclaimer statement.

e. Patents

Small business concerns normally may retain the principal worldwide patent rights to any invention developed with Governmental support. The Government receives a royalty-free license for Federal Government use, reserves the right to require the patent holder to license others in certain circumstances, and requires that anyone exclusively licensed to sell the invention in the United States must normally manufacture it domestically. To the extent authorized by 35 U.S.C. 205, the Government will not make public any information disclosing a Government-supported invention for a 4-year period to allow the Awardee a reasonable time to pursue a patent.

E. COST SHARING

Cost sharing is permitted for proposals under this Program Solicitation; however, cost sharing is not required nor will it be an evaluation factor in consideration of your proposal.

F. PROFIT OR FEE

Reasonable fee (estimated profit) will be considered under this solicitation. For guidance purposes, the amount of profit shall not exceed 10% of total project costs.

G. JOINT VENTURES OR LIMITED PARTNERSHIPS

Joint ventures and limited partnerships are eligible provided the entity created qualifies as a small business as defined in this Program Solicitation.

H. RESEARCH AND ANALYTICAL WORK

1. For a SBIR Phase I proposal, a minimum of two-thirds of the research and/or analytical effort, as measured by the budget, must be performed by the proposing small business concern and the balance of one third may be outsourced to a consultant or subcontract or a combination of the two.

2. For a SBIR Phase II proposal, a minimum of one-half of the research and/or analytical effort, as measured by the budget, must be performed by the proposing small business concern and the balance of one-half may be outsourced to a consultant or subcontract or a combination of the two.

I. CONTRACTOR COMMITMENTS

Upon award of a funding agreement, the Awardee will be required to make certain legal commitments through acceptance of numerous clauses in Phase I funding agreements. The outline that follows is illustrative of the types of clauses to which the Contractor would be committed. This list should not be understood to represent a complete list of clauses to be included in Phase I funding agreements, nor to be specific wording of such clauses. Copies of complete terms and conditions are available upon request.

1. INSPECTION. Work performed under the contract is subject to Government inspection and evaluation at all times.

2. EXAMINATION OF RECORDS. The Comptroller General (or a duly authorized representative) shall have the right to examine any directly pertinent records of the awardee involving transactions related to this contract.

3. DEFAULT. The Government may terminate the contract if the Contractor fails to perform the work contracted.

4. TERMINATION FOR CONVENIENCE. The contract may be terminated at any time by the Government if it deems termination to be in its best interest, in which case the Contractor will be compensated for work performed and for reasonable termination costs.

5. DISPUTES. Any dispute concerning the funding agreement that cannot be resolved by agreement shall be decided by the Contracting Officer with right of appeal.

6. EQUAL OPPORTUNITY. The awardee will not discriminate against any employee or applicant for

employment because of race, color, religion, sex, or national origin.

7. AFFIRMATIVE ACTION FOR VETERANS. The awardee will not discriminate against any employee or application for employment because he or she is a disabled veteran or veteran of the Vietnam era.

8. AFFIRMATIVE ACTION FOR HANDICAPPED. The awardee will not discriminate against any employee or applicant for employment because he or she is physically or mentally handicapped.

9. OFFICIALS NOT TO BENEFIT. No Government official shall benefit personally from the contract.

10. COVENANT AGAINST CONTINGENT FEES. No person or agency has been employed to solicit or secure the contract upon an understanding for compensation except bonafide employees or commercial agencies maintained by the Contractor for the purpose of securing business.

11. GRATUITIES. The contract may be terminated by the Government if any gratuities have been offered to any representative of the Government to secure the contract.

12. PATENT INFRINGEMENT. The Contractor shall report each notice or claim of patent infringement based on the performance of the contract.

13. AMERICAN MADE EQUIPMENT AND PRODUCTS. When purchasing equipment or a product under the SBIR funding agreement, purchase only American-made items whenever possible.

J. ADDITIONAL INFORMATION

1. The Program Solicitation is intended for informational purposes and reflects current planning. If there is any inconsistency between the information contained herein and the terms of any resulting SBIR funding agreement, the terms of the funding agreement are controlling.

2. Before award of an SBIR funding agreement, the Government may request the offeror to submit certain organizational, management, personnel, and financial information to assure responsibility of the offeror.

3. The Government is not responsible for any monies expended by the offeror before award of any funding agreement.

4. This Program Solicitation is not an offer by the Government and does not obligate the Government to make any specific number of awards. Also, awards under the SBIR program are contingent upon the availability of funds.

5. The EPA SBIR program is not a substitute for existing unsolicited proposal mechanisms. Unsolicited proposals shall not be accepted under the EPA SBIR program in either Phase I or Phase II.

6. If an award is made pursuant to a proposal submitted under this Program Solicitation, the Contractor will be required to certify that he or she has not previously been, nor is currently being, paid for essentially equivalent work by any agency of the Federal Government.

7. Notwithstanding the relatively broad definition of R/R&D in Section II, Definitions, hereof, awards under this solicitation are limited to APPLIED forms of research. Proposals that are surveys, including market, state-of the-art and/or literature surveys, which should have been performed by the offeror prior to the preparation of the proposal, or the preparation of allied questionnaires and instruction manuals, shall not be accepted. If such proposals are submitted, they shall be considered as not in compliance with the solicitation intent, and therefore, technically unacceptable.

8. The requirement that the offeror designate a topic, and only one topic, (see page 1, Section I above) is also necessary. EPA receives hundreds of proposals each year and has special panels of reviewers for review of each research topic. In order to assure that proposals are evaluated by the correct panel, it is the complete responsibility of the offeror to select and identify the best topic.

9. Instructions to Offerors - Competitive Acquisition (Jan 2004) FAR 52.215-1

(a) *Definitions.* As used in this provision- Discussions are negotiations that occur after establishment of the competitive range that may, at the Contracting Officer's discretion, result in the offeror being allowed to revise its proposal.

"In writing," "writing," or "written" means any worded or numbered expression that can be read, reproduced, and later communicated, and includes electronically transmitted and stored information.

"Proposal modification" is a change made to a proposal before the solicitation's closing date and time, or made in response to an amendment, or made to correct a mistake at any time before award.

"Proposal revision" is a change to a proposal made after the solicitation closing date, at the request of or as allowed by a Contracting Officer as the result of negotiations.

"Time," if stated as a number of days, is calculated using calendar days, unless otherwise specified, and will include Saturdays, Sundays, and legal holidays. However, if the last day falls on a Saturday, Sunday, or legal holiday, then the period shall include the next working day.

(b) *Amendments to solicitations.* If this solicitation is amended, all terms and conditions that are not amended remain unchanged. Offerors shall acknowledge receipt of any amendment to this solicitation by the date and time specified in the amendment(s).

(c) *Submission, modification, revision, and withdrawal of proposals.* (1) Unless other methods (e.g., electronic commerce or facsimile) are permitted in the solicitation, proposals and modifications to proposals shall be submitted in paper media in sealed envelopes or packages (I) addressed to the office specified in the solicitation, and (ii) showing the time and date specified for receipt, the solicitation number, and the name and address of the offeror. Offerors using commercial carriers should ensure that the proposal is marked on the outermost wrapper with the information in paragraphs (c)(1)(i) and (c)(1)(ii) of this provision.

(2) The first page of the proposal must show-

(i) The solicitation number;

(ii) The name, address, and telephone and facsimile numbers of the offeror (and electronic address if available);

(iii) A statement specifying the extent of agreement with all terms, conditions, and provisions included in the solicitation and agreement to furnish any or all items upon which prices are offered at the price set opposite each item;

(iv) Names, titles, and telephone and facsimile numbers (and electronic addresses if available) of persons authorized to negotiate on the offeror's behalf with the Government in connection with this solicitation; and

(v) Name, title, and signature of person authorized to sign the proposal. Proposals signed by an agent shall be accompanied by evidence of that agent's authority, unless that evidence has been previously furnished to the issuing office.

(3) *Submission, modification, revision, and withdrawal of proposals.* (i) Offerors are responsible for submitting proposals, and any modifications or revisions so as to reach the Government office designated in the solicitation by the time specified in the solicitation. If no time is specified in the solicitation, the time for receipt is 4:30 p.m., local time, for the designated Government office on the date that proposal or revision is due.

(ii)(A) Any proposal, modification or revision received at the Government office designated in the solicitation after the exact time specified for receipt of offers is "late" and will not be considered unless it is received before award is made, the Contracting Officer determines that accepting the late offer would not unduly delay the acquisition; and--

(1) If it was transmitted through an electronic commerce method authorized by the solicitation, it was received at the initial point of entry to the Government infrastructure not later than 5:00 p.m. one working day prior to the date specified for receipt of proposals; or

(2) There is acceptable evidence to establish that it was received at the Government installation designated

for receipt of offers and was under the Government's control prior to the time set for receipt of offers; or

(3) It is the only proposal received.

(B) However, a late modification of an otherwise successful proposal that makes its terms more favorable to the Government, will be considered at any time it is received and may be accepted.

(iii) Acceptable evidence to establish the time of receipt at the Government installation includes the time/date stamp of that installation on the proposal wrapper, other documentary evidence of receipt maintained by the installation, or oral testimony or statements of Government personnel.

(iv) If an emergency or unanticipated event interrupts normal Government processes so that proposals cannot be received at the office designated for receipt of proposals by the exact time specified in the solicitation, and urgent Government requirements preclude amendment of the solicitation, the time specified for receipt of proposals will be deemed to be extended to the same time of day specified in the solicitation on the first work day on which normal Government processes resume.

(v) Proposals may be withdrawn by written notice received at any time before award. Oral proposals in response to oral solicitations may be withdrawn orally. If the solicitation authorizes facsimile proposals, proposals may be withdrawn via facsimile received at any time before award, subject to the conditions specified in the provision at 52.215-5, Facsimile Proposals. Proposals may be withdrawn in person by an offeror or an authorized representative, if the identity of the person requesting withdrawal is established and the person signs a receipt for the proposal before award.

(4) Unless otherwise specified in the solicitation, the offeror may propose to provide any item or combination of items.

(5) Offerors shall submit proposals in response to this solicitation in English, unless otherwise permitted by the solicitation, and in U.S. dollars, unless the provision at FAR 52.225-17, Evaluation of Foreign Currency Offers, is included in the solicitation.

(6) Offerors may submit modifications to their proposals at any time before the solicitation closing date and time, and may submit modifications in response to an amendment, or to correct a mistake at any time before award.

(7) Offerors may submit revised proposals only if requested or allowed by the Contracting Officer.

(8) Proposals may be withdrawn at any time before award. Withdrawals are effective upon receipt of notice by the Contracting Officer.

(d) *Offer expiration date.* Proposals in response to this solicitation will be valid for the number of days specified on the solicitation cover sheet (unless a different period is proposed by the offeror).

(e) *Restriction on disclosure and use of data.* Offerors that include in their proposals data that they do not want disclosed to the public for any purpose, or used by the Government except for evaluation purposes, shall-

(1) Mark the title page with the following legend: This proposal includes data that shall not be disclosed outside the Government and shall not be duplicated, used, or disclosed-in whole or in part-for any purpose other than to evaluate this proposal. If, however, a contract is awarded to this offeror as a result of-or in connection with-the submission of this data, the Government shall have the right to duplicate, use, or disclose the data to the extent provided in the resulting contract. This restriction does not limit the Government's right to use information contained in this data if it is obtained from another source without restriction. The data subject to this restriction are contained in sheets [insert numbers or other identification of sheets]; and

(2) Mark each sheet of data it wishes to restrict with the following legend: Use or disclosure of data contained on this sheet is subject to the restriction on the title page of this proposal.

(f) *Contract award.* (1) The Government intends to award a contract or contracts resulting from this solicitation to the responsible offeror(s) whose proposal(s) represents the best value after evaluation in accordance with the factors and

subfactors in the solicitation.

(2) The Government may reject any or all proposals if such action is in the Government's interest.

(3) The Government may waive informalities and minor irregularities in proposals received.

(4) The Government intends to evaluate proposals and award a contract without discussions with offerors (except clarifications as described in FAR 15.306(a)). Therefore, the offeror's initial proposal should contain the offeror's best terms from a cost or price and technical standpoint. The Government reserves the right to conduct discussions if the Contracting Officer later determines them to be necessary. If the Contracting Officer determines that the number of proposals that would otherwise be in the competitive range exceeds the number at which an efficient competition can be conducted, the Contracting Officer may limit the number of proposals in the competitive range to the greatest number that will permit an efficient competition among the most highly rated proposals.

(5) The Government reserves the right to make an award on any item for a quantity less than the quantity offered, at the unit cost or prices offered, unless the offeror specifies otherwise in the proposal.

(6) The Government reserves the right to make multiple awards if, after considering the additional administrative costs, it is in the Government's best interest to do so.

(7) Exchanges with offerors after receipt of a proposal do not constitute a rejection or counteroffer by the Government.

(8) The Government may determine that a proposal is unacceptable if the prices proposed are materially unbalanced between line items or subline items. Unbalanced pricing exists when, despite an acceptable total evaluated price, the price of one or more contract line items is significantly overstated or understated as indicated by the application of cost or price analysis techniques. A proposal may be rejected if the Contracting Officer determines that the lack of balance poses an unacceptable risk to the Government.

(9) If a cost realism analysis is performed, cost realism may be considered by the source selection authority in evaluating performance or schedule risk.

(10) A written award or acceptance of proposal mailed or otherwise furnished to the successful offeror within the time specified in the proposal shall result in a binding contract without further action by either party.

(11) If a post-award debriefing is given to requesting offerors, the Government shall disclose the following information, if applicable:

(i) The agency's evaluation of the significant weak or deficient factors in the debriefed offeror's offer.

(ii) The overall evaluated cost or price and technical rating of the successful and the debriefed offeror and past performance information on the debriefed offeror.

(iii) The overall ranking of all offerors, when any ranking was developed by the agency during source selection.

(iv) A summary of the rationale for award.

(v) For acquisitions of commercial items, the make and model of the item to be delivered by the successful offeror.

(vi) Reasonable responses to relevant questions posed by the debriefed offeror as to whether source-selection procedures set forth in the solicitation, applicable regulations, and other applicable authorities were followed by the agency.

(10) Organizational Conflicts of Interest (EPAAR 1552.209-71) (May 1994) Alternate I (May 1994)

(a) The Contractor warrants that, to the best of the Contractor's knowledge and belief, there are no relevant facts or circumstances which could give rise to an organizational conflict of interest, as defined in FAR Subpart 9.5, or that the

Contractor has disclosed all such relevant information.

(b) Prior to commencement of any work, the Contractor agrees to notify the Contracting Officer immediately that, to the best of its knowledge and belief, no actual or potential conflict of interest exists or to identify to the Contracting Officer any actual or potential conflict of interest the firm may have. In emergency situations, however, work may begin but notification shall be made within five (5) working days.

(c) The Contractor agrees that if an actual or potential organizational conflict of interest is identified during performance, the Contractor will immediately make a full disclosure in writing to the Contracting Officer. This disclosure shall include a description of actions which the Contractor has taken or proposes to take, after consultation with the Contracting Officer, to avoid, mitigate, or neutralize the actual or potential conflict of interest. The Contractor shall continue performance until notified by the Contracting Officer of any contrary action to be taken.

(d) Remedies - The EPA may terminate this contract for convenience, in whole or in part, if it deems such termination necessary to avoid an organizational conflict of interest. If the Contractor was aware of a potential organizational conflict of interest prior to award or discovered an actual or potential conflict after award and did not disclose it or misrepresented relevant information to the Contracting Officer, the Government may terminate the contract for default, debar the Contractor from Government contracting, or pursue such other remedies as may be permitted by law or this contract.

(e) The Contractor agrees to insert in each subcontract or consultant agreement placed hereunder provisions which shall conform substantially to the language of this clause, including this paragraph, unless otherwise authorized by the Contracting Officer.

(11) Data Universal Numbering System (DUNS) Number, (Oct 2003), FAR 52.204-6

(a) The offeror shall enter, in the block with its name and address on the cover page of its offer, the annotation “DUNS” or “DUNS+4" followed by the DUNS number or “DUNS+4" that identifies the offeror's name and address exactly as stated in the offer. The DUNS number is a nine-digit number assigned by Dun and Bradstreet, Inc. The DUNS+4 is the DUNS number plus a 4-character suffix that may be assigned at the discretion of the offeror to establish additional CCR records for identifying alternative Electronic Funds Transfer (EFT) accounts (see Subpart 32.11) for the same parent concern.

(b) If the offeror does not have a DUNS number, it should contact Dun and Bradstreet directly to obtain one.

(1) An offeror may obtain a DUNS number--

(i) If located within the United States, by calling Dun and Bradstreet at 1-866-705-5711 or via the Internet at *http://www.dnb.com*; or

(ii) If located outside the United States, by contacting the local Dun and Bradstreet office.

(2) The offeror should be prepared to provide the following information:

(i) Company legal business name.

(ii) Tradestyle, doing business, or other name by which your entity is commonly recognized.

(iii) Company physical street address, city, state and Zip Code.

(iv) Company mailing address, city, state and Zip Code (if separate from physical).

(v) Company telephone number.

(vi) Date the company was started.

(vii) Number of employees at your location.

(viii) Chief executive officer/key manager.

(ix) Line of business (industry).

(x) Company Headquarters name and address (reporting relationship within your entity).

(12) Central Contractor Registration, (July 2006), FAR 52.204-7

(a) Definitions. As used in this clause--

"Central Contractor Registration (CCR) database" means the primary Government repository for Contractor information required for the conduct of business with the Government.

"Data Universal Numbering System (DUNS) number" means the 9-digit number assigned by Dun and Bradstreet, Inc. (D&B) to identify unique business entities.

"Data Universal Numbering System +4 (DUNS+4) number" means the DUNS number assigned by D&B plus a 4-character suffix that may be assigned by a business concern. (D&B has no affiliation with this 4-character suffix.) This 4-character suffix may be assigned at the discretion of the business concern to establish additional CCR records for identifying alternative Electronic Funds Transfer (EFT) accounts (see the FAR at Subpart 32.11) for the same parent concern.

"Registered in the CCR database" means that--

(1) The Contractor has entered all mandatory information, including the DUNS number or the DUNS+4 number, into the CCR database; and

(2) The Government has validated all mandatory data fields, to include validation of the Taxpayer Identification Number (TIN) with the Internal Revenue Service (IRS), and has marked the record "Active". The Contractor will be required to provide consent for TIN validation to the Government as a part of the CCR registration process.

(b)(1) By submission of an offer, the offeror acknowledges the requirement that a prospective awardee shall be registered in the CCR database prior to award, during performance, and through final payment of any contract, basic agreement, basic ordering agreement, or blanket purchasing agreement resulting from this solicitation.

(2) The offeror shall enter, in the block with its name and address on the cover page of its offer, the annotation ``DUNS" or ``DUNS +4" followed by the DUNS or DUNS +4 number that identifies the offeror's name and address exactly as stated in the offer. The DUNS number will be used by the Contracting Officer to verify that the offeror is registered in the CCR database.

(c) If the offeror does not have a DUNS number, it should contact Dun and Bradstreet directly to obtain one.

(1) An offeror may obtain a DUNS number--

(i) If located within the United States, by calling Dun and Bradstreet at 1-866-705-5711 or via the Internet at *http://www.dnb.com*; or

(ii) If located outside the United States, by contacting the local Dun and Bradstreet office.

(2) The offeror should be prepared to provide the following information:

(i) Company legal business.

(ii) Tradestyle, doing business, or other name by which your entity is commonly recognized.

(iii) Company Physical Street Address, City, State, and Zip Code.

(iv) Company Mailing Address, City, State and Zip Code (if separate from physical).

(v) Company Telephone Number.

(vi) Date the company was started.

(vii) Number of employees at your location.

(viii) Chief executive officer/key manager.

(ix) Line of business (industry).

(x) Company Headquarters name and address (reporting relationship within your entity).

(d) If the Offeror does not become registered in the CCR database in the time prescribed by the Contracting Officer, the Contracting Officer will proceed to award to the next otherwise successful registered Offeror.

(e) Processing time, which normally takes 48 hours, should be taken into consideration when registering. Offerors who are not registered should consider applying for registration immediately upon receipt of this solicitation.

(f) The Contractor is responsible for the accuracy and completeness of the data within the CCR database, and for any liability resulting from the Government's reliance on inaccurate or incomplete data. To remain registered in the CCR database after the initial registration, the Contractor is required to review and update on an annual basis from the date of initial registration or subsequent updates its information in the CCR database to ensure it is current, accurate and complete. Updating information in the CCR does not alter the terms and conditions of this contract and is not a substitute for a properly executed contractual document.

(g)(1)(i) If a Contractor has legally changed its business name, “doing business as” name, or division name (whichever is shown on the contract), or has transferred the assets used in performing the contract, but has not completed the necessary requirements regarding novation and change-of-name agreements in Subpart 42.12, the Contractor shall provide the responsible Contracting Officer a minimum of one business day's written notification of its intention to (A) change the name in the CCR database; (B) comply with the requirements of Subpart 42.12 of the FAR; and (C) agree in writing to the timeline and procedures specified by the responsible Contracting Officer. The Contractor must provide with the notification sufficient documentation to support the legally changed name.

(ii) If the Contractor fails to comply with the requirements of paragraph (g)(1)(i) of this clause, or fails to perform the agreement at paragraph (g)(1)(i)(C) of this clause, and, in the absence of a properly executed novation or change-of-name agreement, the CCR information that shows the Contractor to be other than the Contractor indicated in the contract will be considered to be incorrect information within the meaning of the “Suspension of Payment” paragraph of the electronic funds transfer (EFT) clause of this contract.

(2) The Contractor shall not change the name or address for EFT payments or manual payments, as appropriate, in the CCR record to reflect an assignee for the purpose of assignment of claims (see FAR Subpart 32.8, Assignment of Claims). Assignees shall be separately registered in the CCR database. Information provided to the Contractor's CCR record that indicates payments, including those made by EFT, to an ultimate recipient other than that Contractor will be considered to be incorrect information within the meaning of the “Suspension of payment” paragraph of the EFT clause of this contract.

(h) Offerors and Contractors may obtain information on registration and annual confirmation requirements via the internet at http://www.ccr.gov or by calling 1-888-227-2423, or 269-961-5757.

(13) Annual Representations and Certifications, (Jan 2006), FAR 52.204-8

(a)(1) The North American Industry Classification System (NAICS) code for this acquisition is 541712.

(2) The small business size standard is 500 employees.

(3) The small business size standard for a concern which submits an offer in its own name, other than on a construction or service contract, but which proposes to furnish a product which it did not itself manufacture, is 500 employees.

(b)(1) If the clause at 52.204-7, Central Contractor Registration, is included in this solicitation, paragraph (b) of this provision applies.

(2) If the clause at 52.204-7 is not included in this solicitation, and the offeror is currently registered in CCR, and has completed the ORCA electronically, the offeror may choose to use paragraph (b) of this provision instead of completing the corresponding individual representations and certifications in the solicitation. The offeror shall indicate which option applies by checking one of the following boxes:

[ ](i) Paragraph (b) applies.

[ ](ii) Paragraph (b) does not apply and the offeror has completed the individual representations and certifications in the solicitation.

(b) The offeror has completed the annual representations and certifications electronically via the Online Representations and Certifications Application (ORCA) website at http://orca.bpn.gov. After reviewing the ORCA database information, the offeror verifies by submission of the offer that the representations and certifications currently posted electronically have been entered or updated within the last 12 months, are current, accurate, complete, and applicable to this solicitation (including the business size standard applicable to the NAICS code referenced for this solicitation), as of the date of this offer and are incorporated in this offer by reference (see FAR 4.1201); except for the changes identified below *[offeror to insert changes, identifying change by clause number, title, date]*. These amended representation(s) and/or certification(s) are also incorporated in this offer and are current, accurate, and complete as of the date of this offer.

FAR Clause #	**Title**	**Date**	**Change**

Any changes provided by the offeror are applicable to this solicitation only, and do not result in an update to the representations and certifications posted on ORCA.

(14) Small Business Program Representations (May 2004) FAR 52.219-1

(a)(1) The North American Industry Classification System (NAICS) code for this acquisition is 541712.

(2) The small business size standard is 500 employees.

(3) The small business size standard for a concern which submits an offer in its own name, other than on a construction or service contract, but which proposes to furnish a product which it did not itself manufacture, is 500 employees.

(b) *Representations.*

(1) The offeror represents as part of its offer that it [ ]is, [ ]is not a small business concern.

(2) *[Complete only if the offeror represented itself as a small business concern in paragraph (b)(1) of this provision.]* The offeror represents, for general statistical purposes, that it [ ]is, [ ]is not, a small disadvantaged business concern as defined in 13 CFR 124.1002.

(3) *[Complete only if the offeror represented itself as a small business concern in paragraph (b)(1) of this provision.]* The offeror represents as part of its offer that it [ ]is, [ ]is not a women-owned small business concern.

(4) *[Complete only if the offeror represented itself as a small business concern in paragraph (b)(1) of this provision.]* The offeror represents as part of its offer that it [ ]is, [ ]is not a veteran-owned small business concern.

(5) *[Complete only if the offeror represented itself as a veteran-owned small business concern in paragraph (b)(4) of this provision.]* The offeror represents as part of its offer that is [ ]is, [ ]is not a service-disabled veteran-owned small business concern.

(6) *[Complete only if the offeror represented itself as a small business concern in paragraph (b)(1) of this provision.]* The offeror represents, as part of its offer, that--

(i) It [ ] is, [ ] is not a HUBZone small business concern listed, on the date of this representation, on the List of Qualified HUBZone Small Business Concerns maintained by the Small Business Administration, and no material change in ownership and control, principal office, or HUBZone employee percentage has occurred since it was certified by the Small Business Administration in accordance with 13 CFR part 126; and

(ii) It [ ] is, [ ] is not a joint venture that complies with the requirements of 13 CFR part 126, and the representation in paragraph (b)(6)(i) of this provision is accurate for the HUBZone small business concern or concerns that are participating in the joint venture. *[The offeror shall enter the name or names of the HUBZone small business concern or concerns that are participating in the joint venture:_____.]* Each HUBZone small business concern participating in the joint venture shall submit a separate signed copy of the HUBZone representation.

(c) *Definitions.* As used in this provision--

"Service-disabled veteran-owned small business concern"-

(1) Means a small business concern-
(i) Not less than 51 percent of which is owned by one or more service-disabled veterans or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more service-disabled veterans; and

(ii) The management and daily business operations of which are controlled by one or more service-disabled veterans or, in the case of a service-disabled veteran with permanent and severe disability, the spouse or permanent caregiver of such veteran.

(2) Service-disabled veteran means a veteran, as defined in 38 U.S.C. 101(2), with a disability that is service-connected, as defined in 38 U.S.C. 101(16).

"Small business concern," means a concern, including its affiliates, that is independently owned and operated, not dominant in the field of operation in which it is bidding on Government contracts, and qualified as a small business under the criteria in 13 CFR Part 121 and the size standard in paragraph (a) of this provision.

"Veteran-owned small business concern" means a small business concern-

(1) Not less than 51 percent of which is owned by one or more veterans (as defined at 38 U.S.C. 101(2)) or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more veterans; and

(2) The management and daily business operations of which are controlled by one or more veterans.

"Women-owned small business concern," means a small business concern --

(1) That is at least 51 percent owned by one or more women; or, in the case of any publicly owned business, at least 51 percent of the stock of which is owned by one or more women; and

(2) Whose management and daily business operations are controlled by one or more women.

(d) *Notice.*

(1) If this solicitation is for supplies and has been set aside, in whole or in part, for small business concerns, then the clause in this solicitation providing notice of the set-aside contains restrictions on the source of the end items to be furnished.

(2) Under 15 U.S.C. 645(d), any person who misrepresents a firm's status as a small, HUBZone small, small disadvantaged, or women-owned small business concern in order to obtain a contract to be awarded under the preference programs established pursuant to section 8(a), 8(d), 9, or 15 of the Small Business Act or any other provision of Federal law that specifically references section 8(d) for a definition of program eligibility, shall --

(i) Be punished by imposition of fine, imprisonment, or both;

(ii) Be subject to administrative remedies, including suspension and debarment; and

(iii) Be ineligible for participation in programs conducted under the authority of the Act.

VI. SUBMISSION OF PROPOSALS

A. Your proposal with an original and two (2) copies shall be received at one of the following addresses by 12:00 p.m. (Noon), local time, on May 3, 2011. Three copies of the application must be submitted: 1) an original, signed copy; 2) a single-sided copy on plain white paper; and 3) another copy for administrative purposes. Offerors are encouraged to also include one CD-ROM with a Portable Document Form (PDF) copy of your proposal.

U.S. POSTAL SERVICE MAIL ADDRESS:

NOTICE: This address should NOT be used for U.S. Postal Service Express Mail Signature Required Service.

U.S. Environmental Protection Agency
Solicitation Number SOL-NC-11-00012- SBIR Phase I
Attention: Judy Ancharski SBIR Phase I
RTP Procurement Operations Division (E105-02)
Research Triangle Park, NC 27711

Offerors are advised that use of U.S. Postal Service Mail may result in delays in receipt of the offer at the required location. Offerors are further advised that delivery to the U.S. Post Office in Research Triangle Park, NC and the Post Office Boxes within that facility does not constitute delivery to the Procurement Operations Division of U.S. EPA in Research Triangle Park, NC.

HAND CARRIED, COURIER DELIVER, AND U.S. POSTAL EXPRESS MAIL SIGNATURE REQUIRED DELIVERY:

Notice: This address should be used for commercial delivery, including Federal Express, United Parcel Service, DHL, and similar carriers. It also includes any hand carried offer from the offeror or its agents. This address must also be used for U.S. Postal Service Express Mail Signature Required.

U.S. Environmental Protection Agency
Solicitation Number: SOL-NC-11-00012 SBIR Phase I
Attention: Judy Ancharski SBIR Phase I
RTP Procurement Operations Division (E105-02)
4930 Old Page Road
Durham, NC 27703

IMPORTANT!!! Please note Section V, Paragraph J.9(c) concerning Late Proposals, Modifications of Proposals and Withdrawal of Proposals.

Telegraphic, telecopied or facsimile proposals will NOT be considered for award.

B. Please do not use special bindings or covers. The original can be stapled in the upper left corner of the proposal. Do not permanently bind or staple the copies; please use either binder or paper clips to secure them.

C. All copies of a proposal shall be sent in the same package.

D. The proposal should be self-contained and written with the care and thoughtfulness accorded papers for publication.

VII. SBIR PHASE I RESEARCH TOPICS

The objective of this solicitation is to increase the incentive and opportunity for small firms to undertake cutting edge, high-risk, or long-term research that has a high potential payoff if the research is successful. Federal support of the front-end research on new ideas, often the highest risk part of the innovation process, may provide small businesses sufficient incentive to pursue such research.

SBIR proposals should consider the lifecycle environmental impacts of the technology itself including (if applicable) minimizing resource use, minimizing toxicity of materials, efficient use of water and energy, minimizing pollution and minimizing impacts of disposal. EPA's SBIR Program does not fund basic research or literature searches. It is recognized that any research and development project starts out as a concept of the inventor. Basic theoretic research studies and preliminary laboratory testing of the concept are often needed to develop an idea. Literature and other surveys and questionnaires are also needed to rule out duplication and inappropriate research study and process detail, finally leading to the design of a prototype apparatus or process that could be tested to show the feasibility of the innovation. Such basic research activities and preliminary studies should be completed before preparing an SBIR proposal.

The proposed research must directly pertain to EPA's environmental mission and must be responsive to EPA program interests included in the topic descriptions of this solicitation. The research should be the basis for technological innovation resulting in new commercial products, processes, or services which benefit the public and promote the growth of the small business. This year's solicitation has nine topics grouped into five general areas: Safe and Sustainable Water Resources (topics include A. Drinking Water and B. Wastewater , Stormwater & Water Reuse), Chemical Safety for Sustainability (topic is C. Innovation in Manufacturing), Sustainable and Healthy Communities (topics include D. Green Building and E. Waste Monitoring), Air/Climate/Energy (topics include F. Greenhouse Gases and Other Climate Change Forcers, G. Air Pollution Monitoring and Control, and H. Sustainable Utilization of Biomass), and I. Homeland Security. This year's solicitation has a special focus on drinking water treatment technologies to meet the needs of the Water Technology Innovation Cluster (WTIC). While the WTIC is focused on one particular geographic area, all topics in this solicitation are open to companies from anywhere in the U.S. This solicitation is open from March 15, 2011 until May 3, 2011 and is available on the EPA SBIR website (www.epa.gov/ncer/sbir).

SAFE AND SUSTAINABLE WATER RESOURCES

EPA recognizes the need to develop and bring to market innovative water technologies that address the removal of multiple contaminants from drinking water, decrease energy demands and costs of treatment and provide solutions to infrastructure challenges. A technology cluster is forming in the Cincinnati/Dayton/Northern Kentucky region to help address this issue (http://www.epa.gov/wtic/). Emphasis has been placed on the needs addressed in EPA's new Drinking Water Strategy (http://water.epa.gov/lawsregs/rulesregs/sdwa/dwstrategy/index.cfm). The cluster's current focus is on drinking water; however, wastewater, stormwater, and water reuse technologies are also included because they increasingly impact each other as water becomes a limiting factor, and thereby cannot be evaluated in isolation. It is envisioned that the regional water technology innovation cluster will promote economic growth and technology innovation in these challenge areas. This cluster has a number of goals including the development and commercialization of innovative technologies to solve environmental challenges and spur sustainable economic development and job growth through the expansion, creation, and attraction of water technology companies and investment. While the WTIC is focused on this geographic area, all topics in this solicitation are open to companies

from anywhere in the U.S.

A. DRINKING WATER

A multitude of drinking water challenges may be addressed by technology solutions. Priority considerations for new technologies include cost, ease of use, and environmental impacts including resource and energy use. Areas of interest include but are not limited to:

DRINKING WATER TREATMENT

- Drinking water treatment technologies to address health risks posed by mixtures of a broad array of contaminants, and groups of like contaminants, including emerging contaminants (currently unregulated). Preferably, technologies will be low-cost, easy to operate, not cause distribution issues, minimize production of residuals, gain public acceptance, use less energy, and comply with regulations.
- Alternative disinfectants and treatment technologies for drinking water that effectively control pathogens without formation of disinfection by-products. Preferably, technologies will be safe to handle and consume, maintain a residual, be low-cost and easy to operate, not cause distribution issues, minimize production of residuals and gain public acceptance.
- Cost-effective drinking water treatment technologies for small/very-small systems and remote systems. Preferably, technologies will be safe to handle (with limited need for manpower and heavy equipment), have low operation and maintenance (O&M) costs, have low initial and replacement cost, be easy to operate and maintain (e.g., packaged turn-key unit operations), not cause distribution and discharge issues, minimize residuals, gain public acceptance, have zero discharge and minimize energy use.
- Drinking water point-of-use/point-of-entry (POU/POE) treatment technologies for operational, regulatory, and management approaches. Preferably, technologies will have capability for real-time remote monitoring of water quality in the distribution system, will address water quality deterioration in the distribution system, be capable of removing microbial contaminants, and utilize O&M practices that protect water quality (e.g., auto-shutoff).
- Drinking water technologies that minimize wastewater and/or residuals handling and disposal costs. Preferably, technologies should not create a hazardous waste, should be low cost and easy to operate and should gain public acceptance.

DRINKING WATER MONITORING AND INFRASTRUCTURE

- Drinking water measurement/monitoring techniques. Preferably, technologies will have an optimal number of sampling points, remain active in the event of loss of utility services (power failure), respond to a wide range of contamination events (short duration intrusion to catastrophic intentional contamination events), be highly discriminatory to avoid false negatives and false positives, be nationally applicable, and include source water monitoring for taste/odor-causing *cyanobacteria.*
- New, lightweight portable instruments to detect and distinguish nanoparticles from natural or incidental particles in aquatic environments.
- Technologies and materials for measuring, assessing, renewing, and managing buried drinking water distribution infrastructure (including storage) to reduce failures and their adverse effects, water loss, low pressure incidents, premature replacement of sound pipes, and life cycle costs to improve capacity for sustainable water infrastructure asset management. Preferably, technologies will be low cost, address variability (materials, diameters), be easy to operate, be reliable/durable, have remote sensing capability, not cause distribution issues, and gain utility acceptance**.**

B. WASTEWATER, STORMWATER AND WATER REUSE

A multitude of wastewater, stormwater and water reuse challenges may be addressed by technology solutions. Areas of interest include but are not limited to:

- Treatment technologies to address health risks posed by mixtures of a broad array of contaminants, including emerging (currently unregulated) contaminants. Preferably, technologies will be low-cost, easy to operate, not cause conveyance system issues, minimize production of residuals, have public acceptance, minimize energy use, comply with regulations and include peak wet weather flow.

- Innovative technologies that enhance the long-term sustainability of wastewater treatment, including approaches to maximize solids removal and the use of anaerobic processes, and minimize or eliminate aeration & energy requirements for aerobic treatment while still meeting secondary or more advanced treatment requirements.
- Technologies and approaches to effectively and reliably eliminate or significantly reduce the introduction of invasive species via ballast water.
- Treatment technologies to capture energy from wastewater and/or wastewater solids, or to recover heat or utilize other green energy sources at wastewater treatment plants.
- Treatment technology for small/very-small systems and remote systems. This could include development of innovative technologies that combine pollution prevention, water reuse, resource recovery and potential economic advantages; with low capital, and operations and maintenance costs. Technologies will be safe to handle (with limited need for manpower and heavy equipment), , have low initial and replacement cost, be easy to operate and maintain (e.g., packaged turn-key unit operations), and minimize energy use.
- Technologies for advanced nutrient removal from wastewater that minimize costs, energy consumption (and associated greenhouse gas emissions), and chemical consumption.
- Technologies that cost-effectively minimize the organic and other pollutant loading from collection systems or satellite treatment facilities to centralized wastewater treatment facilities.
- Sensitive measurement/monitoring technologies for contaminants, nutrients, pathogens, and flow. Preferably, technologies will suitable for multiple contaminants, of appropriate sensitivity and detection limits, be real time, have an optimum number of sampling points, remain active in the event of loss of utility services (power failure), respond to a wide range of contamination events (short duration intrusion to catastrophic intentional contamination events), be highly discriminatory to avoid false negatives and false positives, be nationally applicable, and include leak detection monitoring for conveyance systems.
- Technologies and materials for measuring, assessing, renewing, and managing buried wastewater conveyance infrastructure to reduce failures and their adverse effects, water loss, low pressure incidents, premature replacement of sound pipes, and life cycle costs to improve capacity for sustainable water infrastructure asset management. Preferably, technologies will be low cost, address variability (materials, diameters), easy to operate, reliable/durable, have remote sensing capability, not cause distribution issues, and have utility acceptance.

CHEMICAL SAFETY FOR SUSTAINABILITY

C. INNOVATION IN MANUFACTURING

This topic includes subtopics on green manufacturing, pollution prevention and green chemistry, and rare earth elements.

GREEN MANUFACTURING

Improvements in manufacturing efficiency typically equate to environmental improvements, making manufacturing greener and more cost-effective. In addition, Executive Order 13329 directs EPA to properly and effectively assist the private sector in its manufacturing innovation in order to sustain a strong manufacturing sector in the US economy. Manufacturing-related research and development (R&D) encompasses improvements in existing methods or processes, or wholly new processes, machines or systems. Manufacturing improvements could include unit process level technologies that create or improve manufacturing processes, machine level technologies that create or improve manufacturing equipment and systems level technologies for innovation in the manufacturing enterprise. Technologies should improve workforce abilities and manufacturing competitiveness. Areas of interest include but are not limited to:

- Manufacturing process changes that utilize green technology to improve process efficiency and reduce pollution. These technologies may include non-traditional reactors, novel processing methods, new feedstocks, solvents or chemical systems that improve production efficiency and performance while eliminating or minimizing the use or generation of harmful substances.

- New filtration membranes for organic solvent recovery and similar applications. (Note: EPA has concerns for perfluorinated membranes (e.g. Nafion membranes) if they have been manufactured using PFOA as a

polymerization aid, if the polymer use require elevated temperatures [> 175 C] or if the polymer may be exposed to high intensity electronic beams.

- Technology for solvent free production of chemical products and new or improved catalyst products.

- High surface area and other nanomaterials for new green coatings and environmental applications.

POLLUTION PREVENTION AND GREEN CHEMISTRY

Green chemistry, also known as sustainable chemistry, is the design of chemical products and processes that prevent pollution by reducing or eliminating the use or generation of hazardous substances. Green chemistry applies across the life cycle of a chemical product, including its design, manufacture, and use. EPA's Design for the Environment (DfE) Program works with environmental organizations and industry to protect human health and promote sustainable chemistry. Priority areas for DfE include fluorinated chemicals, preservatives for cleaning products, solubilizers for cleaning products and flame retardants. Safer alternatives to these chemicals would enable the DfE Program to aid an industry transition to safer chemicals. Areas of interest include but are not limited to:

- Non-fluorinated wetting agents - Fluorinated polymers/telomers are used as wetting agents in floor finishes and coatings. The conventional longer-chain C8 chemicals are highly persistent and associated with various health and environmental effects. Even the safest of this class of chemical -- the very short-chain telomers and polymers-- are associated with some level of concern. Safer, non-fluorinated alternatives in this area are needed.

- Less persistent, less toxic preservatives - Preservatives for cleaning products and other applications typically use a mechanism of action that, while preventing degradation of the product, also persist in the environment and often carry moderate to high toxicity. Safer alternatives in this area are needed.

- Safer "solubilizers" - Industry is responding to demand from retailers to deliver more compacted liquid detergents. In order to make the surfactants for the detergents pourable, manufacturers add small amines to surfactant blends. These small amines are associated with a range of health effects. Alternatives that allow detergent compaction, but are not associated with adverse health effects are needed.

- Less toxic flame retardants - Alternative flame retardants, including nano-scale options, to problematic flame retardants are needed. Areas for innovation include flexible and rigid polyurethane foam, high impact polystyrene, and expandable polystyrene for which there are limited FR options.

RARE EARTH ELEMENTS

Rare Earth Elements (REEs) are a group of chemical elements including the Lanthanides (elements 57-71 on the periodic table). Scandium and Yttrium also are occasionally included. REEs are vital to applications in clean energy, information, and defense sectors. An increasing demand on these materials has created concern over the future accessibility of rare earth elements. China has been providing more than 95% of REEs worldwide, but there is interest to develop a sustainable domestic supply chain. As mining in the United States increases more efficient and environmentally responsible mining practices and technologies are needed. Since less than 1% of products containing REEs are recycled at the end of their product-life, effective recycling of spent consumer and industrial products may also reduce the need to develop new mining sites. Landfills and excess mine material piles could become additional sources of REE materials that could be considered for recycling. The environmental benefits of developing a sustainable domestic supply chain through improved mining practices and increased recycling include: reducing the impacts of increased mining, promoting the development of green energy technologies that rely heavily on the materials, and minimizing the impacts of waste and toxins entering landfills. Areas of interest include but are not are limited to:

- Technologies to more effectively and efficiently separate rare earth elements from ores, mine waste tailings, alloys, and mixtures.

- Recycling technologies/methods for products and materials containing rare earth

elements from the built environment, discarded products, the waste stream, and waste disposal sites. This includes innovative and cost-effective ways to separate and recover small amounts of REEs in products.

SUSTAINABLE AND HEALTHY COMMUNITIES

D. GREEN BUILDING

EPA defines g*reen building* as the practice of maximizing the efficiency with which buildings and their sites use resources—energy, water, and materials—while minimizing building impacts on human health and the environment, throughout the complete building life cycle—from siting, design, and construction to operation, renovation, and reuse. This rapidly growing field is driven by concerns about climate change, cost and availability of energy resources and the impacts of buildings on human health and the environment. Design and construction of green buildings has increased dramatically in recent years, and this expansion has given rise to a host of technical, scientific, and economic questions that building professions are not currently configured to answer. Green building must be sustainable for the long-term and effectively address environmental and human health issues relating to materials, energy, indoor environmental quality, water, and building performance at a national scale. For more information on green building, visit http://www.epa.gov/greenbuilding/.

BUILDING MATERIALS

Research is needed to develop new materials and products with minimal environmental and public health impacts over their life cycles. Innovative chemical transformations utilizing green and sustainable chemistry and engineering need to be developed and applied. Areas of interest include but are not limited to:

- New building materials, chemicals, processes, and systems (e.g., safer alternatives to polyurethane spray foam insulation) with minimal environmental and public health impacts and reduced carbon footprints over their full lifecycles. Alternative are needed to reduce emissions of air toxics (e.g. formaldehyde) and biological contaminants (e.g. mold).
- Innovative processes for minimizing waste generation from the construction, renovation and demolition of buildings, including new technologies for boosting safe recycling of materials with low recycling rates (e.g. carpet, asphalt shingles, plastics, tile, and insulation).

ENERGY

Commercial and residential buildings consume about one-third of the world's energy. In particular, U.S. buildings account for more than 40 percent of total U.S. energy consumption, including 72 percent of electricity generation. If current trends continue, buildings worldwide will be the largest consumer of global energy, consuming as much energy as the transportation and industry sectors combined by 2025. Technologies, tools, and practices need to be developed that will enhance the energy efficiency of buildings at multiple scales. Areas of interest include but are not limited to:

- Devices, technologies, and materials that reduce energy needs in existing buildings, including efficient distributed energy delivery systems.

- Building intelligence systems that are able to track overall building energy efficiency and reduce total energy use, particularly in commercial buildings. Technologies to more efficiently match building utilization patterns with energy needs associated with heating and cooling and lighting.

INDOOR ENVIRONMENTAL QUALITY

Research is needed to address knowledge gaps for indoor chemical pollutants including cost-effective technologies to reduce exposures through source modification, ventilation, or contaminant removal. Areas of interest include but are not limited to:

- Sensors and technologies, including in-situ and portable instrumentation, to assist in detection and evaluation of building performance problems with air quality, mold, energy, water, ecosystems, and human health.

- Advanced measurement systems that can be used to continuously measure and characterize contaminants in

buildings and associated process control systems that adjust the need for outside air based on contaminant levels.

- Low cost indoor air cleaners with low pressure drop and minimal maintenance requirements.

WATER USE AND MANAGEMENT

Future goals are to eliminate all stormwater runoff and to maximize the use of storm and rainwater to reduce the need for piped water supplies. Achieving these goals demands innovations in both practices and technologies and research into the long-term performance, environmental benefits, maintenance requirements, and cost-effectiveness of these systems. Areas of interest include but are not limited to:

- Systems to reduce stormwater runoff and remove pollutants from stormwater at existing homes and buildings, including systems that promote stormwater reuse.

- Building systems that optimize water use, such as: new water-saving and recycling technologies that reduce overall building water needs, and increase water recycling and reuse.

E. WASTE MONITORING

EPA's waste management programs are seeking better sampling, analysis, and monitoring technologies to improve landfills, advance hazardous waste site cleanup and regulated waste process activities. This area includes technologies to address industrial and waste processes, accurate and cost effective identification and characterization of contaminants at waste sites, monitoring the performance of site cleanup activities and remedies during both construction and long-term operations, and techniques to support the closeout of cleanup activities and to support land revitalization beyond site cleanup phases. More information on these needs is available at http://clu-in.org/programs/21m2/needs.cfm Areas of interest include but are not limited to:

- Improved testing methods for vapor intrusion. Currently, sampling methods are expensive and the analysis and validation of data is lengthy. Less expensive methods are needed that yield reproducible, defensible results in an expeditious timeframe to assist with decisions regarding the need to address sub-slab vapors.

- Cost-effective sensor technologies for long-term monitoring of groundwater. Chemical specific, in-situ sensors are needed that can be queried remotely multiple times without biofouling or needing maintenance re-calibration. Sensors should meet required pollutant detection levels and be small enough, yet robust and at a reasonable cost to deploy with flux meters and piezometers to characterize change over small vertical and horizontal scales.

- Microelectromechanical systems (MEMS) and nanotechnology-based "smart" sensors for rapid and precise process control and environmental monitoring. Areas of particular interest include remote, in-situ, real-time and continuous measurement of species at trace (ppt) concentrations. Sensors that utilize lab-on-a-chip technology or are biodegradable are also of interest.

- New, lightweight portable instruments to detect and distinguish nanoparticles from natural or incidental particles in aquatic environments.

AIR/CLIMATE/ENERGY

F. GREENHOUSE GASES AND OTHER CLMATE CHANGE FORCERS

Greenhouse gases (GHGs) (e.g., carbon dioxide (CO_2), methane, nitrous oxide) are emitted by a variety of natural and man-made sources. The increasing atmospheric concentrations of these gases have been linked to climate change which has a myriad of environmental and human health implications. As the nation considers a variety of approaches to respond to the climate challenge, government, industry, and academia will be working together to identify the next generation of technologies for use in the power generation, industrial, commercial and residential sectors to reduce greenhouse gas (GHG) emissions. It will be critical that the next generation of technologies is sustainable for the long-

term and does not result in adverse implications to the environment. In addition, as EPA and other agencies consider how to respond to future climate change, it will be critical to understand emissions from the numerous sources that will likely be impacted. EPA is particularly interested in technologies that: 1) minimize environmental impacts of CO_2 control and 2) that reduce non-CO_2 pollutants that contribute to warming (e.g., methane, black carbon, nitrous oxides). In order to design mitigation strategies, improved techniques are needed to better quantify emissions, particularly from dispersed sources. Areas of interest include, but are not limited to:

- Innovative source measurement techniques for dispersed sources of GHG emissions;
- Advanced process changes or use of new materials that can be incorporated into industrial production to reduce overall carbon footprint while minimizing emissions/releases to other environmental media;
- New technologies, process redesigns, or other approaches that can reduce multiple pollutant emissions (including CO_2) from large key industrial sectors at lower costs from sectors including refinery operations, pulp and paper mills and cement kilns;
- Advanced technologies that control methane and other non-CO_2 gases from industrial and commercial operations;
- Technologies and process modifications that can reduce undesirable by-product formation resulting from the use of CO_2 capture technologies;
- Systems that minimize the environmental impact of carbon sequestered from coal-fired power plants, including impurities in the captured carbon stream; and,
- Technologies that minimize the environmental impacts of underground sequestration of CO_2, especially potential negative impacts to groundwater.

G. AIR POLLUTION MONITORING AND CONTROL

AIR POLLUTION MONITORING

Better and lower cost ambient air and stationary source pollution monitors are needed. Devices that operate continuously (suitable for fixed installation) and small highly portable hand held devices (for easy transport) are desired. Instruments capable of measuring particulate matter (PM), ammonia, toxic metals, and toxic organic compounds are of particular interest. Areas of interest include but are not limited to:

- Ambient air instruments are needed that can quantify and speciate the coarse, fine and nanoscale size fractions of PM on a real-time or near real-time basis. PM coarse fraction is defined as the fine particles in the 10 micron to 2.5 micron size range. Nanoscale size PM fraction is defined as particles in the 1 to 100 nanometer size range.
- Instruments are needed for characterization of black carbon for air pollution and climate change issues including instruments that characterize black carbon in source emissions and ambient air. The instrument should be compact, efficient, and near-real time; characterize the particles by size, composition and morphology; and should be robust, require minimal maintenance, and provide near real-time data that can be downloaded remotely or by the Internet.
- Instruments for monitoring compliance with the National Ambient Air Quality Standard (NAAQS) for nitrogen dioxide. New technologies such as photolytic chemiluminescence are needed for the new primary one-hour NO_2 standard.
- More effective monitoring methods for large area sources such as wastewater lagoons, or production leach pads and ponds, solid waste landfills, and similar sources. Characterization is needed for both the particulate and volatile organic compounds (VOCs) emissions. Ultraviolet differential optical absorption spectroscopy (UV-DOAS) is of special interest for ammonia, hydrogen sulfide, carbon disulfide, benzene, formaldehyde, xylenes, and toluene.

- New Cavity Ring-Down Spectroscopic (CRDS) analyzers in the mid infrared region for quantifying large numbers of air toxic compounds that do not have significant spectral bands in the near IR region. The Mid IR - CRDS could be used in a variety of applications such as ambient monitoring, in stack stationary source monitoring, and mobile platforms for measurement of large area sources or in plume measurement for possible source apportionment and plume modeling.

- Portable continuous ambient monitors for hydrogen sulfides at landfills, concentrated animal feeding operations and oil facilities. Instruments should have minimal maintenance and calibration requirements. Detection limits should be 5 parts per billion (ppb) or lower.

- Microelectromechanical systems (MEMS) and nanotechnology-based "smart" sensors for rapid and precise process control and environmental monitoring. Areas of particular interest include remote, in-situ, real-time and continuous measurement of species at trace (ppt) concentrations. Sensors that utilize lab-on-a-chip technology or are biodegradable are also of interest.

AIR POLLUTION CONTROL

Innovative and sustainable control technologies are needed for small sources, such as small industrial boilers and biomass or wood-fired hydronic heaters/boilers and sources with low concentration high volume air streams. Areas of interest include but are not limited to:

- Inexpensive retrofit air pollution control devices for small oil and coal-fired industrial boilers. These small sources (between 10 and 100 million BTU boilers) are collectively large contributors to PM and other air pollution.

- Commercial, institutional and residential gas or oil combustion units that can maintain low emissions of methane, PM, nitrogen oxides (NOx), VOCs and achieve high energy efficiency over long periods with less reliance on manual maintenance.

- Improved commercial or residential combustion/heat transfer technologies for wood stoves, pellet stoves and fireplaces to minimize emissions from use of renewable fuels such as wood or biomass.

- Filters (especially those using nanomaterials) for removal of gaseous pollutants and particulates from contaminated air streams.

- Catalyst systems including those that use nanomaterials, to treat contaminated air streams.

H. **SUSTAINABLE UTILIZATION OF BIOMASS**

EPA is interested in developing technologies that improve efficiency, enhance recovery of waste materials and reduce lifecycle environmental impacts of biomass use.

BIOFUELS

EPA is particularly interested in technologies which address and the environmental implications of biofuels, making their manufacture and use more sustainable. Areas of interest include but are not limited to:

- New, more efficient and cost effective methods for storing and transporting biomass raw materials.

- Technologies to improve process efficiencies and reduce air and water emissions and waste disposal impacts from biofuel production plants.

- Technologies to prevent water from contaminating ethanol during distribution. Cost effective methods for removal of water from ethanol fuel blending.

WASTE-TO-ENERGY SYSTEMS

EPA is interested in "waste-to-energy" technologies that combine energy efficiency with solving waste management problems. Areas of interest include but are not limited to:

- Innovative technologies that produce biofuels or energy from waste materials, including manure and farm wastes, forest wood biomass, grassland biomass, organic non-recyclable components of municipal solid waste, biosolids from wastewater treatment plants, meat rendering, greases and food wastes or other waste material. Includes scaling down of anaerobic digesters to smaller, easier to operate, lower operation and maintenance systems that are cost effective for small farms, and the development of manure-to-energy technologies in semi-arid or arid climates with high solid content feedstock.

- Cost effective gasification technologies and systems designed or modified to gasify animal and farm wastes, including wastes from animal feeding operations (AFOs). (For more information on AFOs, see: www.epa.gov/npdes/afo.)

- Innovative technologies that produce biofuels or energy while capturing greenhouse gas emissions from fuel combustion or other sources such as algae systems.

- Biological systems that produce an enriched, easily transported feedstock for the above or other digester systems.

- Innovative technologies to minimize overall environmental impact of co-firing of biomass with other fuels (e.g. coal).

I. HOMELAND SECURITY

There are significant efforts throughout the government to develop and implement homeland security technologies and systems. Following the September 11, 2001 attacks, EPA was designated as the lead federal agency for the remediation of areas contaminated by terrorist events involving the release of biological threat agents, biotoxins, chemical warfare agents, toxic industrial chemicals, toxic industrial materials, and radiological materials. EPA's role in such emergency response activities typically is in leading and participating in cleanup activities after the initial response has been completed. EPA has also been designated as the lead sector-specific agency for water and is responsible for protecting water systems and detecting and recovering from terrorist attacks affecting them.

EPA needs improved technologies that contain and respond (remediation technologies) to an incident, detect biological organisms (including foreign animal disease agents), biotoxins, chemical warfare agents, toxic industrial chemicals, toxic industrial materials, and radiological materials(particularly detection technologies that help direct decontamination operations), and protect the American people and the environment.

DECONTAMINATION AND WASTE TREATMENT/DISPOSAL

One of EPA's goals is to evaluate, characterize, and develop tools/techniques that can be used to decontaminate buildings and outdoor spaces that have been intentionally contaminated with biological, chemical, and/or radiological threat agents. Areas of interest include but are not limited to:

- Decontamination technologies and systems to remediate enclosed, semi-enclosed, or outdoor facilities (commercial, private, or government owned), structures, open outdoor areas, vehicles, and other critical infrastructure and equipment that have been contaminated with biological threat agents/organisms (including foreign animal disease agents), biotoxins, chemical warfare agents, toxic industrial chemicals, toxic industrial materials, and radiological materials. Such methods need to be capable of decontaminating common indoor and/or outdoor surfaces. Important considerations, in addition to efficacy of decontamination are materials compatibility, cost, safety, availability, ease of use, expendable supply needs, and associated waste management requirements.

- Treatment and disposal methods for biological, radiological, and chemical contaminated waste material generated during the release of the agent and/or remediation process.

DETECTION

To optimize response-time and accelerate cleanup and recovery, the emergency response community needs versatile detection technologies that are highly sensitive to the presence of chemical and biological agents with low false positive rates and that can be deployed in the field, primarily in the characterization and remediation phases of the response as opposed to the initial stages of the response where lifesaving activities are performed. Areas of interest include but are not limited to:

- Test kits and detection technology formats that can quantify and identify biological and chemical (including biotoxins) threat agents on indoor and outdoor surfaces with very low rates of false positives/negatives and low detection limits. Detection technologies should be sensitive to relevant health effects levels or other levels of concern, easy to use, relatively inexpensive, and stable during prolonged storage. EPA is interested in detection technologies for anthrax, smallpox, plague, ricin, botulinum toxin, chemical contact poisons (e.g., highly toxic commercial pesticides), or chemical warfare agents. EPA is primarily interested in technologies that can be of use in the characterization and clearance stages of the response to guide the use of decontamination technologies and sampling activities.

- Sampling technologies to collect chemical, biological, and radiological contaminants from porous and non-porous surfaces such as vinyl, tile, glass, painted surfaces, concrete, wood, fabrics, and carpet.

DRINKING WATER AND WASTEWATER SYSTEMS SECURITY

This research may address either physical or cyber threats potentially resulting in disablement and disruption in services provided by various-sized drinking water and wastewater treatment systems. Technologies, equipment, and other tools are needed to detect, measure, and monitor for the presence of chemical, radiological, and biological contaminants. These technologies will be used by drinking water and wastewater utility operators and emergency response personnel. Classes of contaminants of concern include: biological organisms (e.g., spores, viruses, and bacteria); biotoxins, and chemicals (including pesticides, toxic industrial chemicals, and chemical warfare agents). Ideally, technologies developed that satisfy this research area should also benefit the larger context of safe water under non-threat situations. Needs include, but are not limited to:

- Technologies for detecting, measuring, and monitoring drinking water and wastewater for the presence of chemical, biological, and radiological contaminants that could be introduced pre- or post- treatment. These technologies may include hand-held, in-line, or slip stream devices that can provide a result in near-real-time. Research is also needed for improved equipment longevity and reliability under conditions relevant to drinking water or wastewater treatment systems.

- Technologies for the decontamination of drinking water system pipelines. In the event that a drinking water system becomes contaminated, in addition to removing and treating contaminated water, it will also be necessary to remove contaminants that become trapped on or adhere to the inside pipe walls.

- Technologies to provide real-time information about the topography and structure of the material that has accumulated on the inside walls of the pipeline. This may include remote video, remotely controlled pigs, or other such devices. It is desirable that such remotely controlled device can be used to collect samples (of water and from pipe walls), and perform in situ analysis of select drinking water contaminants.

VIII. SUBMISSION FORMS AND CERTIFICATIONS

The attached forms, Appendix A - Proposal Cover Sheet, Appendix B - Project Summary, and Appendix C - SBIR Proposal Summary Budget, should be downloaded and printed from the Internet or photocopied, and completed as indicated under Section III, Proposal Preparation Instructions and Requirements. The purpose of these forms is to meet the mandate of law or regulation and simplify the submission of proposals.

Appendix A
U.S. ENVIRONMENTAL PROTECTION AGENCY
SMALL BUSINESS INNOVATION RESEARCH PROGRAM
SBIR PHASE I SOLICITATION NO. SOL-NC-11-00012

PROPOSAL COVER SHEET

PROPOSAL TITLE_____
_____
FIRM NAME:_____
ADDRESS:_____
CITY:_____ STATE:_____ ZIP:_____

AMOUNT REQUESTED:$ _____ PROPOSED DURATION (PHASE I): 6 MOS
(Not to Exceed $80,000)
******Proposals submitted in response to this solicitation will be valid for 300 days*******

RESEARCH TOPIC (check one)
____ A. Drinking Water
____ B. Wastewater, Stormwater and Water Reuse
____ C. Innovation in Manufacturing
____ D. Green Building
____ E. Waste Monitoring
____ F. Greenhouse Gases and Other Climate Change Forcers
____ G. Air Pollution Monitoring and Control
____ H. Sustainable Utilization of Biomass
____ I. Homeland Security

CERTIFICATIONS AND AUTHORIZATIONS: Answer Y (Yes) or N (No)

____1. The above concern certifies that it is a small business concern and meets the definition as stated in the program solicitation.
____2. The above concern certifies that a minimum of 2/3 of the research and/or analytical effort will be performed by the proposing firm.
____3. If the proposal does not result in an award, is the Government permitted to disclose the title and technical abstract page of your proposed project, and the name, address, and telephone number of the official of the proposing firm to any inquiring parties?
____4. The above concern certifies that it is a woman owned small business concern and meets the definition as stated in the program solicitation.*
____5. The above concern certifies that it is a socially and economically disadvantaged small business concern and meets the definition as stated in the program solicitation.*
____6. The above concern certifies it is a HUBZone small business concern and meets the definition as stated in the program solicitation.*
____7. Do you plan to send, or have you sent, this proposal or a similar one to any other federal agency? If yes, which? Use acronym(s) for each agency, (e.g., DOD, NIH, DOE, NASA, etc.)_____

8. Choose one of the following to describe your Organization Type:
_____Individual _____Partnership _____Corporation_____LLC

9. Provide the following information: Tax Identification No:_____
Dun & Bradstreet Number:_____ Common Parent Name:_____

* For statistical purposes only.

ENDORSEMENTS

Principal Investigator:
Print Name:_____
Title:_____
Telephone:_____
Fax:_____
Email:_____
Signature:_____
Date:_____

Corporate/Business Official:
Print Name:_____
Title:_____
Telephone:_____
Fax:_____
Email:_____
Signature:_____
Date:_____

PROPRIETARY NOTICE: These data shall not be disclosed outside the Government and shall not be duplicated, used or disclosed in whole or in part for any purpose other than evaluation of this proposal. If a funding agreement is awarded to this offeror as a result of or in connection with the submission of these data, the Government shall have the right to duplicate, use, or disclose the data to the extent provided in the funding agreement and pursuant to applicable law. This restriction does not limit the Government's right to use information contained in the data if it is obtained from another source without restriction. The data subject to this restriction are contained on pages_____of this proposal.

Appendix B
U.S. ENVIRONMENTAL PROTECTION AGENCY
SMALL BUSINESS INNOVATION RESEARCH PROGRAM
SBIR PHASE I SOLICITATION NUMBER SOL-NC-11-00012
PROJECT SUMMARY (Limit to Two Pages)

FIRM NAME, ADDRESS, TELEPHONE AND FAX NUMBER, AND E-MAIL ADDRESS:

Firm Name:
Address:
City:

Telephone:
Fax:
State:
Email:

TITLE OF PROPOSAL:

RESEARCH TOPIC LETTER AND DESCRIPTION:

NAME, TITLE AND E-MAIL ADDRESS OF PRINCIPAL INVESTIGATOR/PROJECT MANAGER:

TECHNICAL ABSTRACT, RESULTS, AND POTENTIAL COMMERCIAL APPLICATION (Limit to 400 Words; Must be Publishable):

Appendix C
SBIR PROPOSAL SUMMARY BUDGET

(See Instructions on Reverse Side)

_____
Organization and Address

_____
A. DIRECT LABOR(PI and other staff, list separately) Hours/Est. Rate: $

_---

_____
B. OVERHEAD: $

_____
C. OTHER DIRECT COSTS: (list separately) $

_____
D. TRAVEL: List purpose and individuals and or title $

Attend one-day SBIR Kick-Off Meeting in Washington, DC

_____
E. CONSULTANTS: (List Est. Rate and Hours) $

_____
F. GENERAL AND ADMINISTRATIVE: $

_____

TOTAL COSTS (Total of A thru F above)
_____ $_____

G. PROFIT (____%) Not to exceed 10% of total project costs $_____
==========

TOTAL PROJECT PRICE (Total costs + Profit) **$_____**

PRINT NAME: TITLE:

_____ _____

SIGNATURE: DATE SUBMITTED:

_____ _____

This proposal is submitted in response to EPA SBIR Program Solicitation No. SOL-NC-11-00012 and reflects our best estimate as of this date.

INSTRUCTIONS FOR APPENDIX C

The purpose of this form is to provide a vehicle whereby the offeror submits to the Government a pricing proposal of estimated costs with detailed information for each cost element, consistent with the offeror's cost accounting system.

If the completed summary is not self-explanatory and/or does not fully document and justify the amounts requested in each category, such documentation should be contained, as appropriate, on a budget explanation page immediately following the budget in the proposal. The form Appendix C will count as one page in the 25 page limit, and any budget explanation pages included will count separately toward the 25 page limit. (See below for discussion on various categories.)

A. Direct Labor - List individually all personnel included, the estimated hours to be expended and the rates of pay (salary, wages, and fringe benefits).

B. Overhead - Specify current rate(s) and base(s). Use current rate(s) negotiated with the cognizant federal negotiating agency, if available. If no rate(s) has (have) been negotiated, a reasonable rate(s) may be requested for Phase I which will be subject to approval by EPA. Offerors may use whatever number and types of overhead rates that are in accordance with their accounting systems and approved by the cognizant federal negotiating agency, if available.

C. Other Direct Costs - List all other direct costs which are not otherwise included in the categories described above, i.e., computer services, publication costs, subcontracts, etc. List each item of permanent equipment to be purchased, its price, and explain its relation to the project.

D. Travel - Address the type and extent of travel and its relation to the project. Include travel expenses for a one-day SBIR Phase I Kick-Off Meeting in Washington, DC.

E. Consultants - Indicate name, daily compensation, and estimated days of service.

F. General and Administrative (G&A) - Same as B. above.

G. Profit - Reasonable fee (estimated profit) will be considered under this solicitation. For guidance purposes, the amount of profit should not exceed 10% of total project costs.

Appendix D
COMMERCIALIZATION FACT SHEET
(Finding Commercial Products; Conducting a Patent Search; Searching for Federal Research; Standards/Certifying Bodies)

FINDING COMMERCIAL PRODUCTS

The technology you are proposing may already be being sold in the market.

Web Search using General Search Engines

There are around 320 million indexed web pages and the web continues to grow exponentially. One problem with this rate of growth is that no single web search engine is capable of indexing the whole of cyberspace. We recommend using at least one meta-engine and two search engines.

A meta-engine is a search engine which searches other engines that actually catalog or index sites. Examples are Metacrawler, www.metacrawler.com, and Dogpile, www.dogpile.com. We use that search to identify which search engines seem to be producing the best results and then use those engines for more complicated queries which cannot be supported by metacrawler and other meta-engines.

Three engines for more detailed searches are Yahoo (www.yahoo.com), Bing (www.bing.com), and Google (http://www.google.com).

When searching, expand or narrow your keywords over time. For example, when searching for "sapphire liquid crystal displays," you may want to broaden to liquid crystal displays or just displays. Also remember to use abbreviations such as LCD. Another good idea is to use Booleans rather than strings. By this we mean using liquid AND crystal AND display rather than “liquid crystal display” as a single term. That way, if you are using jargon, you are less likely to miss items based on a different jargon.

Some search sites useful for looking for specific information about products are:

Thomas Register of American Manufacturers: Long a staple of corporate buyers and market researchers, you can access Thomas Register on-line for free at www.thomasnet.com . Once you obtain your free membership, you can search the 155,000 companies by product. You may have to try a few different keywords to get hits.

GlobalSpec: A search engine focuses on the needs of the engineering community. Again it is free but you must register. It is found at www.globalspec.com.

Press Releases: PR Newswire (http://www.prnewswire.com/), Businesswire (www.businesswire.com), and Marketwire (www.marketwire.com) redistribute corporate press releases. These provides coverage of newly released products that might not otherwise be found on the web as well as information on companies.

Hoovers : Hoovers on-line at www.hoovers.com provides access to profiles on over 12,000 companies. These are the major firms in America, including subsidiaries of foreign operations. By using the keyword search, you can look for companies making products in areas related to your technology. Hoovers provides hypertext links to go to the company's web page. Phone, fax, and street address are also provided. If you cannot find the information on the web, ask for relevant product literature from their marketing departments.

Patents: We discuss patent searches in the next section of this FactSheet. Look for patents related to your technology, then examine the assignee field. Companies licensing or patenting technology in areas related to your technology are competitors that may be introducing products similar to the one you are considering proposing. Search for their web pages using one of the resources above.

CONDUCTING A PATENT SEARCH

What is a patent? A patent is a right to an invention that is granted by the U.S. Government or a foreign government. It gives the holder an exclusive right to use an invention during a period of time. In the United States, before a patent can be issued, the inventor must demonstrate his or her invention is new and non-obvious. To be new, an invention must not have been known nor made by others in the U.S. The invention also cannot have been previously patented or presented in a publication prior to the claimed date on which the invention was made. Patents are handled by the U.S. Patent Office.

Non-obvious is established with reference to what would be obvious to a person of ordinary skill in the relevant technology (or technologies) at the time of the invention. A general rule is that the more complicated the technology and the greater the rate at which it is developing, the higher the skill-level of that hypothetical ordinary person. Non-obvious is determined by examining prior patents, technical publications, and non-secret work being conducted. Usually some aspect of an invention will be non-obvious and thus capable of being patented.

It is important to recognize that different rules apply in different countries. In the U.S., you have one year from the time of first disclosure, use, publication, or sale of an invention to patent the invention. Where more than one person or group makes a claim to be the inventor, the patent goes to the person or group that can demonstrate priority in time. Overseas, the rules are different. Usually the invention must be patented before any public disclosure, use, publication, or sale. In case of a dispute, priority goes to the first person or group to apply for a patent, regardless of who may actually be the inventor. You can, however, get the same overseas priority rights you would get from simultaneously filing overseas and in the U.S. if you file in each relevant country within 12 months of a U.S. patent application.

How to search for U.S. patents: To search the Patent Office go to http://patents.uspto.gov/index.html .

The Boolean search capability of the Patent Office enables constructing complicated searches to narrow in on patents of interest. It allows two terms Booleans in the first search, with more complicated queries when refining a search. You can search specific sets of years or the entire database. The advanced search gives you the ability to look in any or all of the fields in the patent -- a very nice feature. Coverage includes all patents issued no later than one week earlier. It includes all utility, design, and plant patents since 1976. Claims and pictures are not included. (See below, Reading Patents.)

The IBM Patent server contains over 2 million patents. Where drawings are part of the patent, they have been scanned in and can be viewed. Off the home page, you have the option of searching from 1995 to present or 1971 to present. Hypertext links on the home page let you search by patent number, use Boolean Logic, or do a text search in various sections of the patent. Try to be as targeted as possible in your search terms. For example, "environmental monitor" will return 42 patents issued in 1995 or later on IBM's server. "Mercury monitor," by comparison, returns only three.

In today's global economy, it is not sufficient to only search domestically. For international patent applications go to the World Intellectual Property Organization at http://www.wipo.int/portal/index.html.en and conduct a search. We also recommend searching the European Patent Office at http://www.epo.org/patents/patent-information/free.html.

Reading Patents: Once you have found a patent that looks relevant for your interests, examine the abstract and the claims. The abstract provides an overview of what is covered. The claims give you the specific scope of the patent.

There are three paths for finding other patents of interest, once you have found the first one. The first method is to look at the class (or classes) of the patent. You can find patents addressing similar problems by looking in those classes. To fine tune the classes to use, look at a number of relevant patents. Examine the classes that are listed on the patent. Select those classes that most frequently appear across your sample of patents for further examination.

The second method is to look at the patents cited as references. The final method is to look at patents that reference the one you are examining. By searching text, relevant classes, and patents referred to or referencing relevant patents you can quickly determine if a U.S. patent has issued on a technology of interest. CAUTION: Examining U.S. patents does not assure you the technology has not been patented elsewhere. Further, if the patent is only applied for and has not yet been issued, you will not find it.

SEARCHING FOR FEDERAL RESEARCH

There are two sets of publicly available data on Federal Research. FEDRIP, or Federal Research in Progress, provides access to current civilian agency research. FEDRIP includes:

- Department of Agriculture
- Department of Energy
- Department of Veterans Affairs
- Environmental Protection Agency
- Federal Highway Administration
- National Institutes of Health
- NASA
- National Science Foundation
- US Geological Survey
- National Institute of Standards and Technology
- Nuclear Regulatory Commission
- Small Business Innovation Research

Go to www.ebscohost.com/thisTopic.php?marketID=4&topicID=1232 and request a free trail.
In addition, by going to an agency's web site, you can find information on their current and/or past awards. The National Technical Information Service (NTIS) is the designated repository of research reports. It contains technical reports and other government-produced information products. The free access parts may be searched at http://www.ntis.gov/.

STANDARDS AND CERTIFYING BODIES

If you are going to introduce a commercial product, it most likely will have to meet certain standards and be certified as meeting those standards. For example, we all are familiar with the Underwriter Laboratories seal found on household electrical products -- a certification of safety under normal use.

A wide range of bodies creates standards or certifies products. To find relevant standards, we recommend beginning at the American National Standards Institute's search engine for global standards at www.nssn.org.

In the U.S., private sector laboratories, like UL commonly do certification. These organizations rely on standards developed by consensus bodies such as the American Society for Testing and Materials (http://www.astm.org/) or federal agencies such as EPA. ASTM also maintains an International Directory of Testing Laboratories at: http:www.astm.org/labs/. The Directory can be searched by geographic location, lab name, subject area, or keywords.

THE EPA SBIR COMMERCIALIZAZTION SUPPORT WEBSITE

Our Commercialization Assistance Program (CAP) support contractor maintains a website to enable Phase I applicants to better understand the commercialization process and the commercial potential of their technologies. To log into the site, please go to epacapreg.foresightst.com and register. There is no fee.

On the site you will you will find a tutorial on commercialization and how to conduct market research. A variety of tools for doing your market research are also present, include searchable databases of standards bodies and industry and government technology needs roadmaps.

Appendix E
FREQUENTLY ASKED QUESTIONS (FAQs)

Q. Where can I find information about the current SBIR Solicitation?
A. The Solicitation requirements are posted on the NCER/SBIR website (http://www.epa.gov/ncer/sbir/) and also the RTP Procurement website (http://www.epa.gov/oam/rtp__cmd). A SBIR Fact Sheet is posted on these sites which provides additional information about the program.

Q. Is our company eligible for a SBIR contract?
A. The Small Business Innovation Research (SBIR) program is a phased process across the Federal Government of soliciting proposals and awarding funding agreements for research (R) or research and development (R&D) to meet stated agency needs or missions. Only small business concern businesses are eligible to participate. A small business concern is described in full in the solicitation

Q. After submitting a proposal, what is the next step?
A. Once a proposal has been issued and considered to be responsive, it will be forwarded for External Peer Review. You may expect to receive written feedback in early January 2012. Proposals evaluated "Very Good" and "Excellent" will also undergo an EPA Programmatic Review, as described in the solicitation. It is anticipated that approximately 25-30 contracts will be made in February 2012 with a start date of March 1, 2012.

Q. If a brief description/summary is provided about an offeror's technology, could a representative from EPA recommend the topic that best fits our technology?
A. It is the complete responsibility of the offeror to select and identify the best topic for their proposals as stated in Section I of the Solicitation.

Q. Can more than one proposal be submitted?
A. The same proposal cannot be submitted under more than one topic. An organization may, however, submit separate proposals on different topics, or different proposals on the same topic, as long as the proposals are not duplicates of the same research principle modified to fit the topic. If such duplicates are submitted, only one will be reviewed. Refer to Sections IV, V and VI for additional requirements.

Q. Can we request a copy of the Solicitation or supporting Appendices?
A. This office does not mail copies of the solicitation. However, the solicitation and appendices are available for download on the following website: http://www.epa.gov/ncer/sbir/

Q. Do we need a DUNS number in order to submit a proposal?
A. In order to do business with a Federal Agency, firms must be registered in the Central Contractor's Registration (CCR) and will need a DUNS to complete the CCR. The registration in both systems may take 2-5 days for completion after information is entered. The proposal can be submitted without the registrations, but registrations must be completed before an award can be made. The phone number to call to obtain more information on registration are 1-888-227-2423 or 269-961-5757.

Q. "What is" and "Who should be" the "Endorser" in regards to the proposal?
A. The Endorser is usually the Principal Investigator or President of the Company.

Q. What is the best way to protect proprietary information contained in our proposal?
A. A Proprietary Notice is located on the bottom of Appendix A, "Proposal Cover Sheet".

Q. Do we have to have a Tax Identification number before submitting a proposal?
A. No. BUT a Tax Identification is required at time of award.

Q. Can we use a consultant or subcontractor?
A. As stated in the Solicitation, for a SBIR Phase I proposal, a minimum of two-thirds of the research and/or analytical

effort, as measured by the budget, must be performed by the proposing small business concern and the balance of one third may be outsourced to a consultant or subcontractor or a combination of the two.

Q. Can a modification or update to a proposal be issued?
A. An Offeror can submit changes, updates prior to the closing date. After the closing date, there is NO opportunity to modify or update a proposal unless the change is requested by the Contracting Officer.

IMPORTANT!!

IF YOU WISH TO RECEIVE AN ACKNOWLEDGMENT CARD TO CONFIRM RECEIPT OF YOUR PROPOSAL, PLEASE COMPLETE A STANDARD SELF-ADDRESSED STAMPED POSTCARD CONTAINING THE FOLLOWING INFORMATION AND ATTACH TO THE ORIGINAL OF EACH PROPOSAL:

Please type the following and fill in the blanks as appropriate:

This will acknowledge the receipt of your proposal titled:

_____

_____

Topic Letter _____. The evaluation of proposals and the award of SBIR Contracts will require approximately 10 months, and no information on proposal status will be available until final selection(s) is made. Your proposal has been assigned EPA No. _____(to be filled in by EPA).

Date:_____

REVERSE SIDE: Please type the following in the upper left-hand corner (return address) and self-address the card to your corporate official: (Post cards that do not meet postal service standards will not be returned).

_____

U.S. EPA
RTP/POD (E105-02)
RTP, NC 27711

_____

Your Firm Name
Address
City, State Zip Code

_____